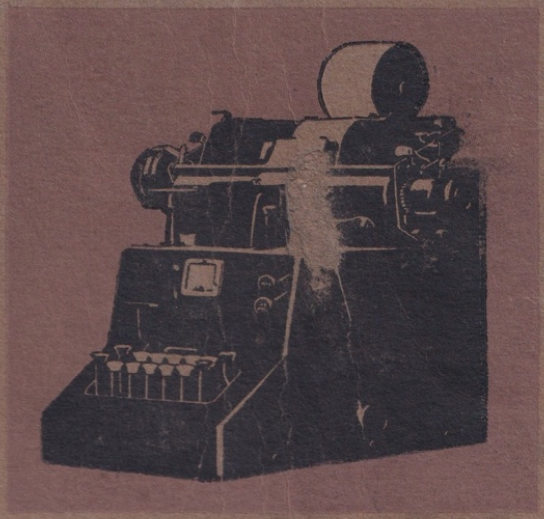

The Dalton

Super Model

Adding Calculating Machine

Its operation use and care

The Dalton Super Model

Adding-Calculating Machine

—Its Operation, Use and Care

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WILLIAMSPORT, PA.

PRINTED IN U. S. A.

LISTING and adding on the Dalton Super Model are really so simple and the operation of its mechanisms is so natural and obvious that the average operator, after noting the functions of the various key and lever controls, is disposed to proceed without further reference to the printed instructions. Because of the fact, however, that the operator in this way so frequently overlooks important features and fails to take advantage of valuable functions and capacities of the machine which might have been utilized with the greatest advantage, ***at least one careful reading*** of the instructions is suggested and earnestly recommended. New applications of the machine will be sure to occur to you as a result of later perusals.

Foreword

This book is published for the use and benefit of the multiplied thousands of enthusiastic owners and users, everywhere:

(*a*) Of the SIMPLEST adding machine ever placed upon the market
In order that its simplicity may be made of still greater benefit;

(*b*) Of the FASTEST adding machine ever touched by the fingers of an operator.....
In order that its speed may be directed into still more effective channels;

(*c*) Of the MOST VERSATILE adding machine that ever brought relief to a weary brain.....
In order that it may lift from weary workers still more and heavier burdens;

(*d*) Of the MOST DURABLE adding machine possible to build out of the best materials money can buy.....
In order that, by more intelligent operation and care, its period of usefulness may be still further extended;

and to the above mentioned ends the book is earnestly and respectfully dedicated by

The Dalton Adding Machine Sales Co.

Cincinnati, Ohio, U. S. A.

1922

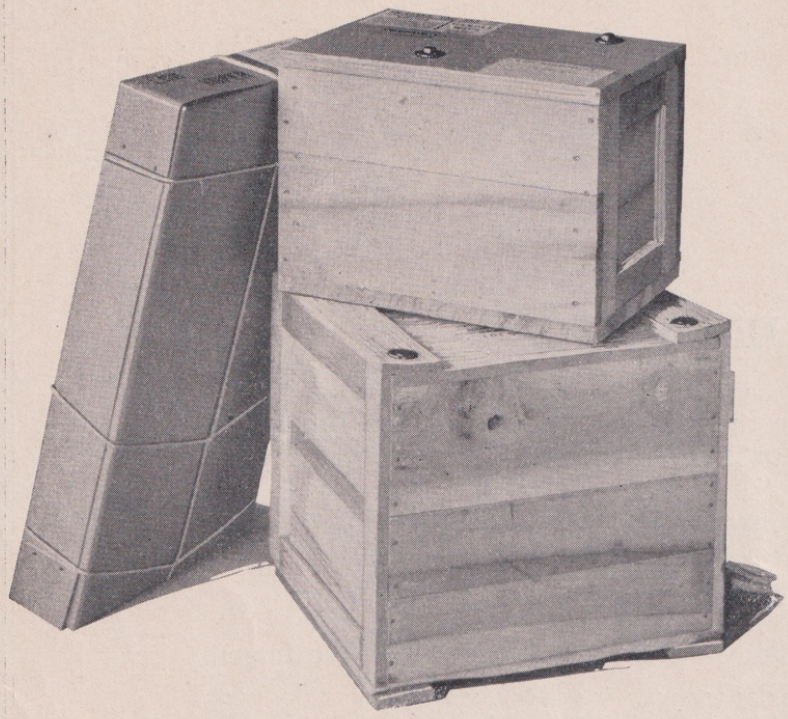


Figure 1
Machine, Motor Drive and Stand Packed for Shipment

When the Machine Arrives

Unpack and set up the stand first. Place the lower casting so that the full segment or curve of the cross piece will be toward the front. This is to provide necessary space for the feet of the operator. Then select the two legs which are provided with thumb-screws at the bottom and fasten them to the casting at the front corners with cap-screws. As the legs are rights and lefts, be careful that the bend turns away from the casting. This applies also to the rear legs, which are to be fastened to the cross piece in the same way. Now take the top casting, turn the lugs for drop-leaf supports toward the left and attach to legs by cap-screws, giving each screw a few turns to hold the stand together loosely. See that the stand is placed on a level surface and then proceed to draw up all the cap-screws, screwing them tight. Next, detach the wire support for drop-leaf and insert lower ends into the holes in the legs. Then remove the two little rubber washers or gaskets from the holes from which the ends of the wire support were removed and re-insert them, but from the *other side* (outside).

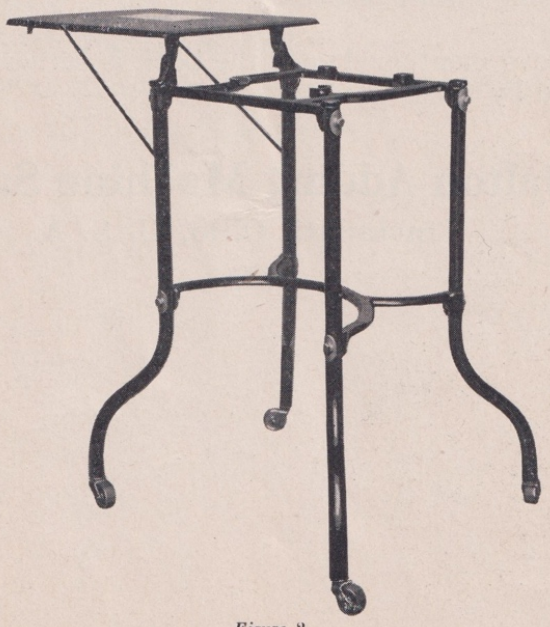


Figure 2
The Low Stand

Then attach drop-leaf by removing one hinge screw in top casting and slip hinge on drop-leaf over the other hinge screw in castings, being sure that the rubber washer is still in position, and then replace the hinge screw that was removed.

Unpacking Motor Drive

Assuming that a motor drive is included in the installation, open the packing case by removing the two nuts on the top and, after disengaging the drive by unscrewing the nuts on the inside, remove from box and place on the stand so that the knob on the end of the motor shaft will be at the rear. Now examine the current specifications as stamped on the brass name-plate of the motor, and if they conform to the current you are using, screw plug into a socket and depress the little arm or lever on the left-hand end of the rock shaft which extends across the top of the drive at the front. This should start the motor. Let it run for a minute or so, or until the current cuts off, which it should do automatically.

Carefully preserve the wooden packing case, with all of the screws, for future use.

Unpacking the Machine

(1) After removing top part of box, unscrew the clamping screw which enters the machine from the right bracket attached to the bottom of box by inserting a large nail or long punch into the hole in the outer end of clamping screw.

(2) Remove wing-nuts from right clamping bracket, lifting bracket from the bolts.

(3) Move the machine to the right until it is clear of the left clamping screw and lift it from the box, placing it on the motor drive with the keyboard toward the front. See that the dowel pins on the drive enter the holes in the base of the machine provided for that purpose. The dowels securely locate the machine relative to the motor drive. If there be no motor drive, place machine directly on the stand.

(4) After removing the wrappings from machine, take the two screws which will be found tied in a little sack at-

tached to the right knob of paper carriage and insert them into the holes where the clamping screws entered.

(5) Remove knurled locking screw in the rear of the right end of the fixed paper carriage rail. It bears a red tag.

(6) Carefully collect the nuts, brackets and screws, place them in the packing box, fasten the lid securely and store for future use.

The 6-inch, 10-inch and 13-inch carriages are shipped on the machines. The wider carriages (18-inch, 24-inch and 30-inch) are packed separately. Special instructions for mounting the wide carriages will be furnished when necessary on request.

Repacking Machine

(1) Insert the knurled locking screw into the rear of the right end of the fixed rail of the paper carriage and shift the carriage so that screw will enter the hole in the sliding rail and lock the carriage against movement even though the tabulator release be held down. Place a heavy piece of cardboard rolled to a diameter of about one inch behind the paper deflector to hold the paper guides in place. If the machine is provided with the long paper guides, turn them back so they will lie in a horizontal position.

(2) Place bottom of box with side marked "Front" toward you.

(3) Place left clamping bracket (the one with the lock-nut on the clamping screw) on the short bolts in bottom of box at the left, put washers on the bolts and screw wing-nuts down part way, leaving the bracket loose.

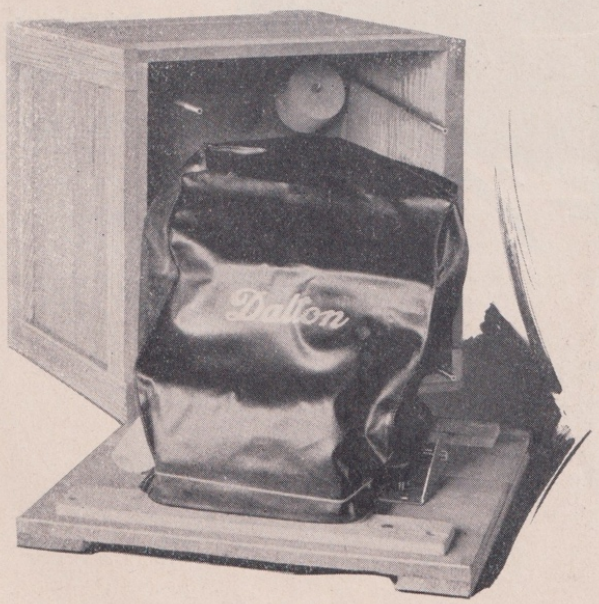


Figure 3
The Machine Mounted on Base with Box Removed

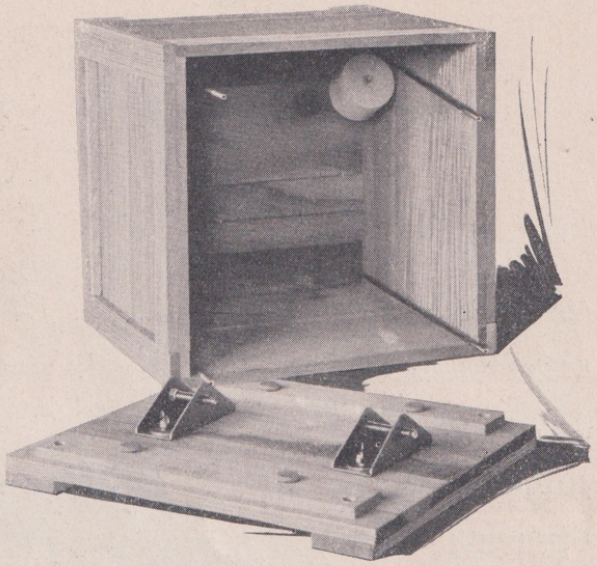


Figure 4
Bottom of Box Showing Clamping Brackets

(4) Remove the middle one of the three screws on each side of the machine near the bottom, wrapping them in a bag or piece of cloth, and attach to right knob of the paper carriage.

(5) Place machine neatly wrapped in the rubber cover on bottom of box with keyboard toward you and slide to left so that clamping screw in left bracket will enter the hole from which the middle screw was removed.

(6) Raise right side of machine and place right clamping screw in middle screw hole, and while holding in this position, lower machine. The right bracket should now go over the two short bolts in bottom of box and the machine should rest on the four rubber pads.

(7) Move machine to left as far as possible and screw down wing-nuts on left bracket with the fingers. Place washers and wing-nuts on right bolts and screw wing-nuts down.

(8) Screw right clamping screw into the middle screw hole as tight as possible. To turn the screw, insert a large nail or long punch into the hole in the end.

(9) Screw the four wing-nuts down tight, using a wrench.

(10) Lift the base of box on which machine is now mounted, invert it, letting the machine down into the box, and see that the four bolts enter holes in corners of base. Put washers on bolts and then fasten by screwing nuts down tight. Now invert box so that base carrying machine is at the bottom, placing shipping tag and notice to handle carefully on top of box.

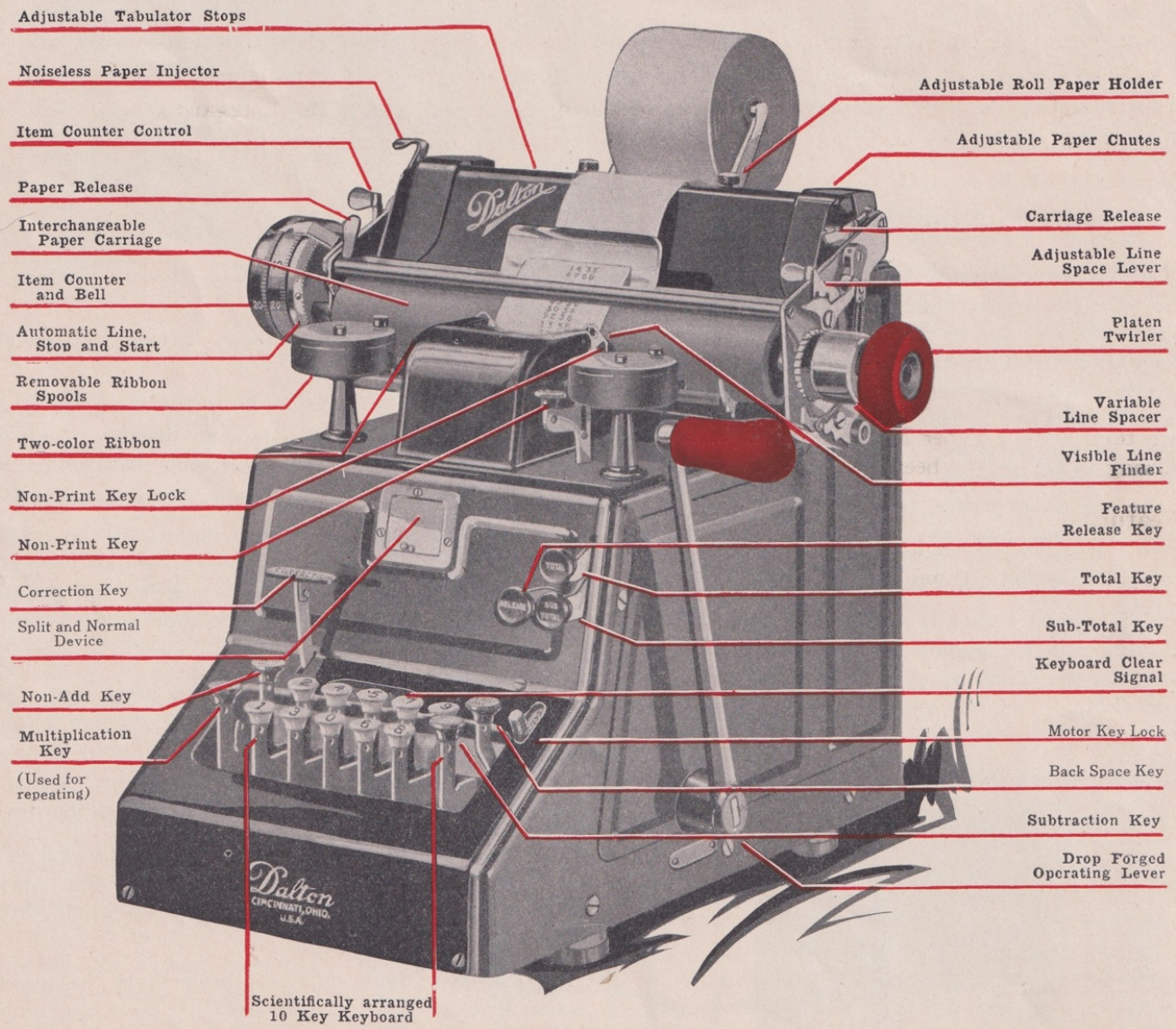


Figure 5
Model 190 - 100

Important

Some Super Model machines do not have all of the features indicated in the cut appearing on the opposite page, which cut shows a standard, fully equipped model (190-100). Other models lack some one or more of these features, and it should be understood that those portions of the instructions which relate to features not present in any given model are to be disregarded so far as that machine may be concerned.

Added Features

Since the 100 class Super Model was brought out, the following features have been added:

Feature release key. The total key, sub-total key, subtraction key and non-add key are now arranged to latch when depressed, and are automatically released after the machine has been operated. This renders it unnecessary to hold the feature keys after operation. Should one of these keys be depressed erroneously, it may be instantly released by pushing in the feature release key.

Motor key lock. This is located at the right of the keyboard and slides back and forth. When pushed towards the rear the word "motor" may be read through the opening. The operating handle is then locked and the machine may be operated only by the motor. When the slide is pushed forwardly, the word "hand" appears in the opening, which signifies that the machine is now adjusted for hand operation, the motor bar being locked. This feature appears on the machine even though it has not been equipped with the motor drive unit and is then valuable in permitting the operator to lock the machine against operation by others when necessary to leave work in the machine temporarily.

All Super Model class 100 machines are so equipped that the electric drive unit may be added at any time. In that event the machine has only to be placed on the drive for instant use and may be removed when desired for use elsewhere as a hand operated machine.

The universal, simplified 10-key keyboard which is identical on all Dalton machines regardless of model, permits use of the touch method of operation whereby speed may be increased from 25 to 80 per cent and liability to error through striking a wrong key reduced in even greater proportion. Fatigue from continued operation and eye strain from focusing eyes back and forth from data to machine are likewise eliminated. Instructions for acquiring touch method appear in the back part of this book.

Learn Touch Operation

The ability to command every numeral key by the thumb and fingers of one hand without hand or arm movement and to select the keys to be operated by the sense of feeling or "touch" alone while the eye of the operator follows the data from which the figures added are being taken is an advantage enjoyed by the Dalton operator alone. It is impossible with all other adding machines. This "Touch" Method of operation, as it has been called, will increase speed from 25% to 80%, depending upon the character of work, and will reduce liability of error from depressing the wrong key in even

Figure 6
Eyes on the Work, Fingers on the Keys

greater proportion than this; while excessive fatigue and eye-strain from continued operation of the machine at great speed are entirely eliminated. It is recommended that you learn to operate the Dalton by the Touch Method, which, by following the instructions beginning on page 37, will be found easy and simple.

Simplified Keyboard

The keyboard of the Dalton comprises only the ten keys—1, 2, 3, 4, 5, 6, 7, 8, 9 and 0. It is so arranged as to be commanded by the fingers of a single hand, and is operable without arm movement, eye reference or thought of decimal order. As a Dalton operator once expressed it: "The fingers find and depress the keys so easily and naturally that you are not conscious of any effort. Writing figures on the Dalton seems really more like just *thinking* them into the machine."

This simple little keyboard is the fastest instrument that has ever been produced for the registration of numbers. There is a limit to the speed which may be attained, just as would be true of a snare drum. That limit lies, however, not in the device itself, but in the *brain and fingers of the operator.* The operation of the Dalton may therefore be taken up with absolute assurance that no machine-made limitation can stand in the

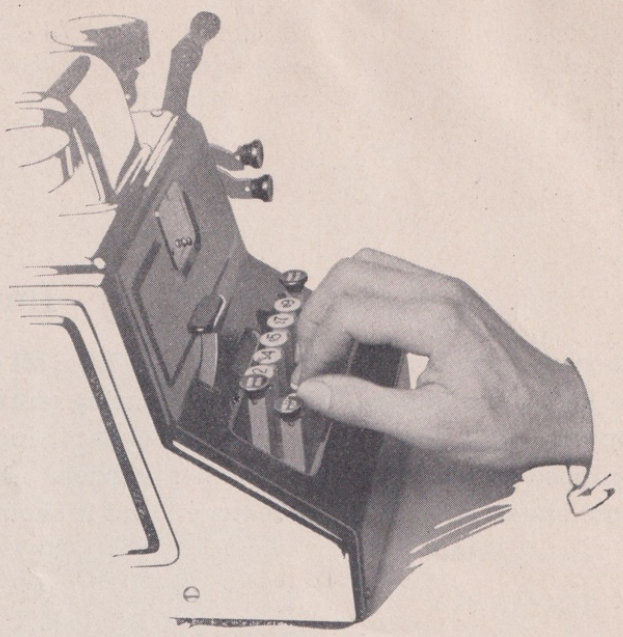


Figure 7
The Keyboard which has made Touch Operation of the Adding Machine Possible

way of the full expression of the operator's personal factor of speed: For it is that personal factor—*just that*—which a speed record on the Dalton represents. No operator has yet been fast enough to subject the *machine itself* to a test of speed. There is, however, no harm to try.

Key Touch

The key touch of the Super Model is very light and rapid, a slight tap—just enough to push the key down—being all that is required.

The Operating Lever

A complete forward and backward stroke of the operating lever or handle must be made after an amount has been "set up" or struck on the keys. Correct manipulation of the handle will promote speed, comfort and ease of operation. Do not *grip* the handle. With palm downward, place the fingers of the right hand, *slightly curved*, upon the handle (see Fig. 8), and pull it forward and downward quickly and evenly. Jerking the lever will retard rather than accelerate speed. When the lever has reached its extreme forward position, release it by removing the hand. Do not try to assist its return movement.

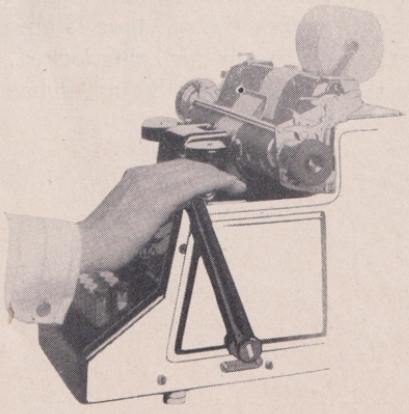


Figure 8
"Do Not Grip the Handle"

The handle may be quickly and easily removed when desired by grasping it at the lower end and giving it a pull straight out from the machine. This enables the operator to protect unfinished work which must be left over night, as without the handle further operation is impossible. When replacing handle and resuming the work always see that the keyboard clear signal shows clear or—what amounts to the same thing—depress correction key to its limit.

The Motor Bar

The motor bar is located just in front of the numeral keys. If the machine is being used in connection with the electric motor drive, depression of the motor bar produces the full equivalent of a lever stroke, *i. e.*, one complete operation of the machine as required in printing and adding an amount. To repeat by use of the motor bar, simply hold it in depressed position, releasing when the desired operations of the machine have been secured. Whenever in these instructions an operation of the handle is called for it should be understood that a depression of the motor bar of an electrically equipped machine answers the requirement.

The Electric Motor Drive

Every Dalton machine is from first to last a complete mechanism for operation by the hand lever. There are, in fact, no so called "Electric" Daltons. A separate standard power unit, however, is provided, which is interchangeably operable in connection with *any* Super Model Dalton machine, regardless of its date of manufacture or purchase. This electric power unit sits on a regular Super Model stand, the machine being simply removed, the power unit placed on the stand and the machine in turn placed on top of the power unit. See Fig. 9. After connection has been made with the power circuit the machine will operate electrically.

The hand lever on the machine still remains, so that after hours when current may not be available operation by hand will be possible just as before. Or, if desired, the machine may be lifted off the power unit and carried to another location for use as a hand operated machine. When returned to its position on the power unit it immediately becomes electrically operable once more; for, in removing or replacing the machine in this way, there are absolutely no mechanical connections or adjustments to be made.

Aside from the increased simplicity in construction and greater accessibility incident to the separate unit plan, innumerable further advantages result, such as the following, for instance, to mention no others.

(*a*) In case of accident to either machine or drive, only the unit affected needs be shipped to the factory or repair station.

(*b*) If the accident be to the drive, operation of the machine by hand may continue pending repair of the drive.

(*c*) The purchaser is enabled to economize in the initial outlay by deferring purchase of the power unit. This undoubtedly results in decreased initial sales of electric equipment, but our customers enjoy and appreciate the opportunity thereby afforded to defer a portion of their outlay until a more convenient time; and the order for the motor drive usually comes later on.

Another unique feature of the Dalton electric drive is the provision whereby the current is automatically turned on by the mere act of depressing the motor bar to operate the machine and is automatically turned off again *one minute* after operation of the machine is discontinued. While the turning on of the current in this way without having to operate a switch is greatly appreciated by users as a convenience and time saver, the automatic cut-off feature is of far greater importance. First of all, it prevents waste of current through the operator forgetting to throw off the switch; and more important still, the burning out of motors due to their being permitted to run unattended over night is avoided.

CAUTION: Like all electric motors, Dalton electric drives must be operated only on an electric circuit conforming to the current specifications stamped on the motor name-plate. In moving from one building to another, for instance, before connecting up your electric equipment be sure there is no change in the current. Trouble may also arise when the current is taken from a small generating plant, such as found sometimes in office buildings, due to variations in voltage when elevators or heavy machinery are being operated.

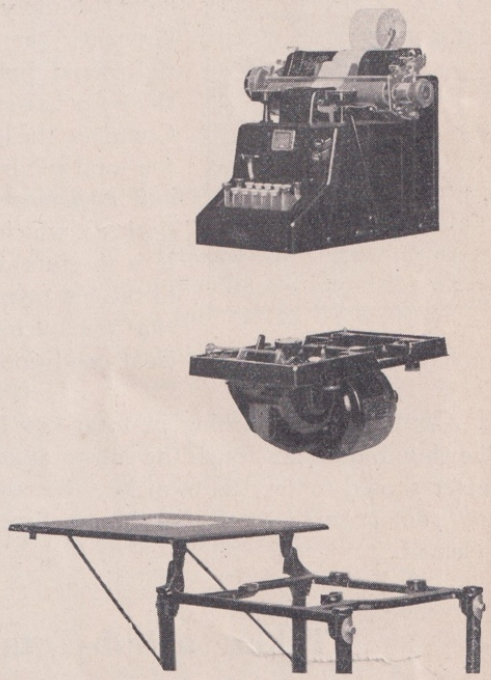


Figure 9
The Motor Drive rests on the Stand and the Machine in turn rests on the Motor Drive. No mechanical connections to make.

Clearing the Machine

Before beginning to list items the operator should know that the machine is clear. To clear the machine, go through the operation of taking a grand total as explained under the succeeding heading, as a result of which the clear sign (*) will be printed. Only by this sign appearing at the beginning of a list can the correctness of the work be checked or proof afforded that the total at the bottom is correct. Always start a list with the clear sign.

Taking a Grand Total

Before taking a total always pull the lever once for a blank or spacing stroke. Note that the total keys of the Super Model are arranged to be operated by the right hand. Not only is it unnecessary for the operator to interrupt the work of the left hand to permit of its use in connection with taking a total, but even the right hand is not required to be taken out of its regular position for operating the lever. Simply push in total key with the thumb of the right hand, holding it in until the lever has started forward. Complete the lever stroke and the total will be printed in red and designated by the clear sign (*), which indicates that it is the total of the amounts in the list preceding and also that the machine was left in a clear condition. See Fig. 10.

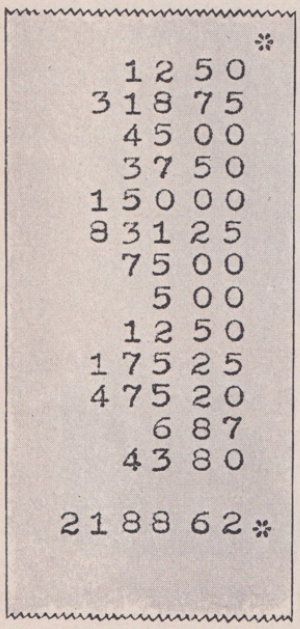


Figure 10
Showing Grand Total

CAUTION: In pushing in total key be careful that the thumb does not touch the sub-total key also. If the latter should follow the total key the result would be a *sub-*, not *a grand* total and the machine would not be "cleared."

Taking a Sub-Total

A sub-total is a record of the sum of listed items to which other items may be added, the amount not being taken out of the machine as in case of a grand total. A sub-total is designated by "s" and is obtained by the same procedure as that required in taking a grand total except that the key marked "sub-total" is used instead of key marked "total." Sub-totals may be taken at any time and in no way affect the accumulated total in the machine. In tabulations of amounts in parallel columns, for instance, sub-totals may be printed at the bottom of a column and again at the top of the next, showing the amount brought forward.

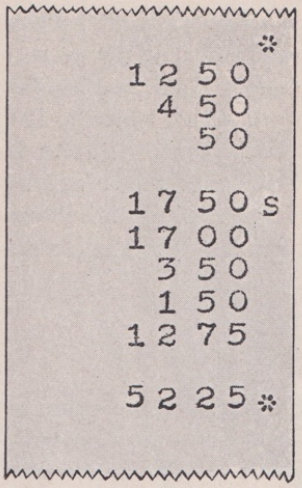


Figure 11
Showing Sub-Total and then a Grand Total

Fig. 11 shows a sub-total of the first three items of the list, to which several other items were then added. The grand total at the end is characterized by the symbol (*) which distinguishes it from a sub-total.

Keyboard Clear Signal

If no keys have been struck since the lever was operated the keyboard clear signal will show blank or "clear." As keys are struck it advances step by step, always registering the number of key operations, or figures that have been set up, since the last operation of the lever. Should the operator strike a key in such a way as to make it doubtful whether or not registration of the figure were secured a glance at the keyboard clear signal will determine the question. The result of operation of the back-space key in removing a figure from the machine may be observed by watching the keyboard clear signal.

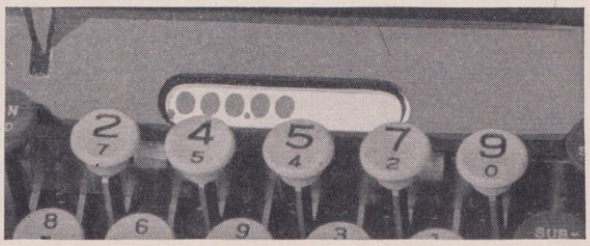


Figure 12
Keyboard Clear Signal

Back-Space Key

Operation of the back-space key removes from the machine the last figure struck on the keys. By its repeated operation, an entire item may be taken out. Among its many important uses, the following may be mentioned:

(*a*) To correct an error resulting from the operation of a wrong numeral key. See "Correction of Errors," page 11.

(*b*) In multiplication when it is desired to use the digits of the multiplier in their left-to-right order. See "Multiplication from Left-to-Right," page 23.

(*c*) In writing consecutive numbers. See "Listing Consecutive Numbers," page 11.

(*d*) When for any purpose it is desired to remove the last one or more figures introduced into the machine without completely destroying the item.

Fig. 13 was printed by locking down multiplication key and depressing back-space key after each handle operation.

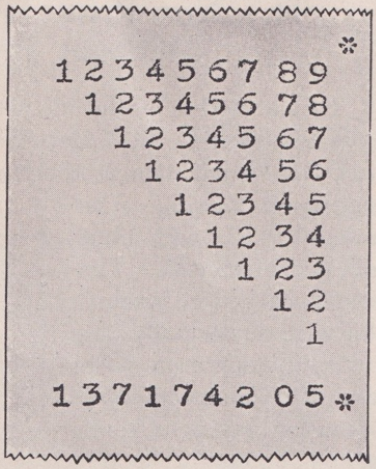


Figure 13
Illustrating Use of Back-Space Key

Correction of Errors

(*a*) *By correction key*: If a wrong key be depressed and the error noted before the operating lever has started forward the amount set up may be taken out by depressing the correction key to its limit. This removes the entire item, as will be indicated by the keyboard clear signal. The amount may then be rewritten correctly. In using the correction key always be sure that it is depressed until it reaches the limit of its movement.

(*b*) *By back-space key*: When a wrong key has been depressed and that fact discovered before another key operation has taken place, depress the back-space key. This will throw out the erroneous figure only, when the item may be completed by depressing the proper key or keys. It may be explained that a single operation of the back-space key removes the last figure introduced and successive operations continue to throw out figures one at a time in *reverse* order of their original introduction. By observing the keyboard clear signal, the operator may always know how many figures of an item remain in the machine.

(*c*) *By non-print and non-add keys*: Depression of these keys will prevent both the printing and the adding of an erroneous item. The non-add symbol (v) would be printed, however, and the paper moved one line-space.

(*d*) *By subtraction key*: If an error be made but not discovered until after the item has been added the erroneous item may be corrected at any time by subtraction. (See "Subtraction.") When depressed, the subtraction key stays down until completion of the next handle operation. If depressed in error pull it back to position.

It is possible to correct an error even after the handle has started forward and the correction and other keys are locked, by placing a straight edge across the ends of the type-carriers and pressing them back to their idle position. Because of the great skill and care required to do this properly, and the danger of locking the machine, however, this method of correcting errors is not recommended.

Repeating Items—Use Multiplication Key

When an item has been set up on the keys it may be repeated or multiplied as many times as desired by depressing and locking or holding down the multiplication key and operating the lever the required number of times. Just before starting the lever forward for the last stroke release the multiplication key. Should you forget to do this, then depress correction key to its limit. Each of the two amounts shown in Fig. 14 was set up on the keys but a single time. By use of the multiplication key each has been printed five times.

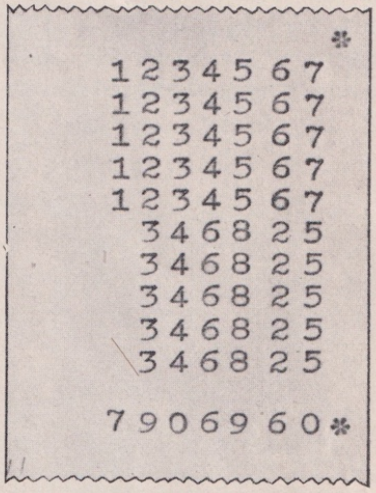


Figure 14
Repeating Items

Listing Consecutive Numbers

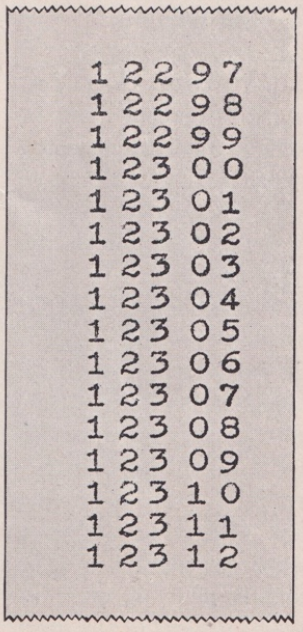


Figure 15
Listing Consecutive Numbers

Depress and lock down multiplication key. Print the first number as for addition. Remove the final figure by depressing back-space key, replacing it by striking numeral key for the next higher digit, and again operate the lever. Whenever the final figure in the number printed is 9, operate back-space key *twice*. If the figure in the second place to the left is also 9, operate back-space key again. In other words, always operate back-space key once and then as many more times as the figure 9 may occur consecutively at the right of the number printed. Always replace the figure or figures taken out by striking the proper numeral key or keys.

The Non-Add Key — Printing Without Adding

As the non-add key is rarely used with two items in succession, no provision is made for latching it in depressed position. It is simply depressed and held down during the printing of an item which is not to be added. Not only does this prevent the item from being added to the total in the machine, but it causes the printing of the non-add symbol (v) in connection with the item to show that the amount has not been included in the toal. Several important uses for this feature may be suggested:

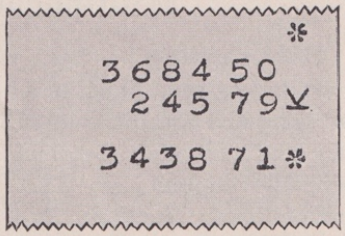


Figure 16
Designating the Subtrahend in Subtraction

(*a*) When it is desired to show the subtrahend in subtraction. See "Subtraction," on page 19.

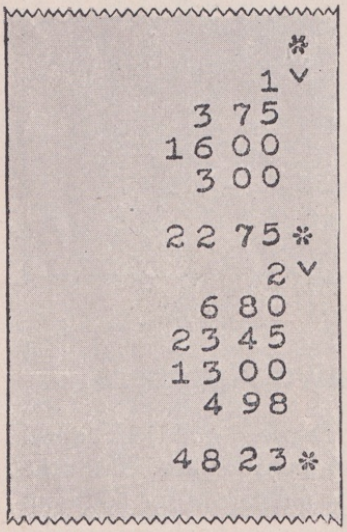


Figure 17
Numbering or Designating Lists of Items

(*b*) To print a number in connection with a list of items to identify or designate it, as in recapitulation of sales by departments, etc.

(*c*) When numbers and amounts (as car numbers and weights) are to be printed alternately in the same column.

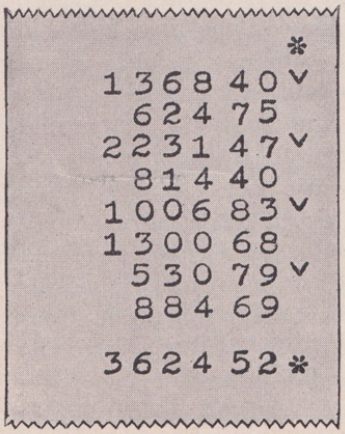


Figure 18
Car Numbers and Weights

(*d*) To mark or designate a certain item or items in a list, all of which are added. For this purpose the symbol "v" should be placed to the left of the item. In order to do this, move the paper carriage over to the right. The keyboard clear signal should always show that there are no figures set up in the machine when the symbol is printed in this way. Otherwise the work would be spoiled by the machine printing such figures to the left of the non-add symbol.

The Non-Print Key — Adding Without Printing

To add without printing, set up the amount on the keys and then as the fingers are placed on the handle, with the thumb depress the non-print key. (See illustration on page 6.) The amount will be added but will not be printed. The non-print key latches down and normally returns to inoperative position after the succeeding operation, but may be restored manually if desired. It may be permanently locked down by moving the little locking lever forward. See Non-Print Key Lock, pages 6 and 7. No printing will then occur until the non-print key lock has been released and the non-print key restored either manually or after a handle operation.

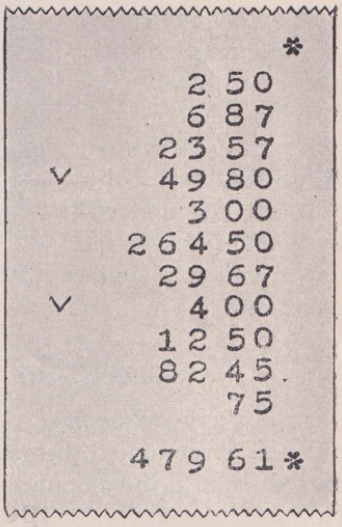


Figure 19
Designating Added Items

This valuable feature may be employed in cases such as the following:

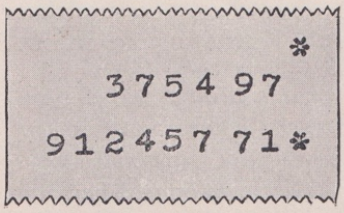


Figure 20
Use of Non-Print Key in Multiplication

(*a*) In multiplication when the work is not to be checked by counting the machine operations for the various digits of the multiplier.

(*b*) At the conclusion of a list of items when it is desired to subtract their total from the amount of a previous addition. It then becomes necessary to get the amount from which the subtraction is to be made into the machine, and to print it again would spoil the appearance of the work.

(*c*) When for any purpose amounts are desired to be introduced into the total without being recorded.

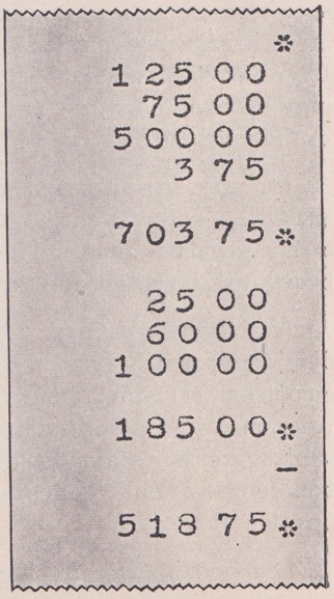


Figure 21
Use of Non-Print Key in Subtraction

Paper Carriage Features

Super Model machines are equipped with paper carriages in standard widths up to thirty inches and designated as follows:

6-inch 10-inch 13-inch 18-inch 24-inch 30-inch

These carriages are of uniform design and interchangeable on all Super Model machines. Every convenience and refinement found in the latest standard writing machines for the rapid, easy and efficient handling of paper have been provided. Provision has also been made for mounting and feeding roll-paper, either of standard or special widths; and even on the narrowest carriage small forms such as bank deposit slips or statements may be inserted. To use sheets, it is necessary only to turn the roll-paper out of the platen.

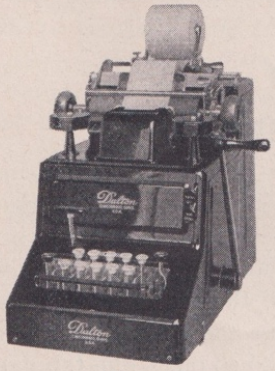


Figure 22
The 6-inch Carriage will handle narrow forms such as Deposit Tickets, Statements, etc.

Paper Roll

The paper roll is supported by two arms slidably mounted on the paper carriage. To put on a new roll of paper, loosen the set-screw on one of the arms and slide it until the empty core is released. Then insert new roll so that the paper will feed from the bottom, replace the arm and tighten the set-screw. The paper should be guided around the platen and made to pass under the cutting bar. If not fed in straight, push paper-release lever back with the left hand, straightening paper with the right.

Inserting a Wide Sheet

Slidable paper chutes or guides serve to locate the sheet of paper in the proper lateral position. Adjust the paper chutes in accordance with the width of the paper and the location in the paper carriage desired. Then drop the end of the sheet between the chutes and into the trough behind the platen, allowing the left hand to depress the paper injector lever. The normal resistance will thus be reduced so that the rubber twirler may be rolled with the right hand merely by frictional contact. This permits very rapid adjustment of the sheet to any desired position and also eliminates the slight clicking sound made by the line-space detent. Do not attempt to insert a sheet of paper under the paper cutter bar. This is for the roll paper only. A convenient feed-roll release lever is located at the left-hand end of the carriage for use in straightening the paper when necessary.

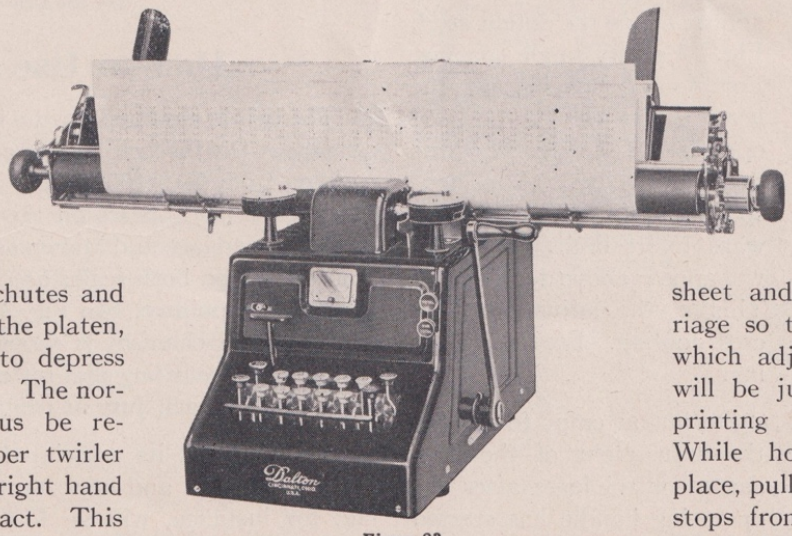


Figure 23
The Carriages are made as wide as 30 inches

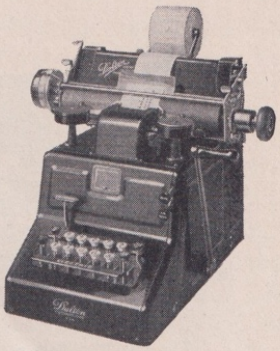


Figure 24
Showing the 10-inch Carriage

Fractional Line Spacer

To make an exact adjustment of the paper in order to print on a horizontally ruled line, push in the right-hand platen twirler knob as far as possible and, while holding it in that position, turn the platen until the exact line position desired is at the top edge of the visible line finder, after which release and then turn platen back *three* single line spaces.

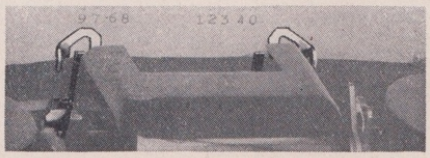


Figure 25
The tops of the Line Finders are three single spaces above the Printing Line

The Tabulator Stops

These are mounted just below and to the rear of the paper-table and are instantly accessible by simply turning back the paper chutes and moving the paper-table forward. To set the stops for any desired vertical ruling, first insert the sheet and then move paper carriage so that the vertical line to which adjustment is to be made will be just to the right of the printing position of the type. While holding the carriage in place, pull out one of the tabulator stops from the bar and insert it in the slot which is in registry with

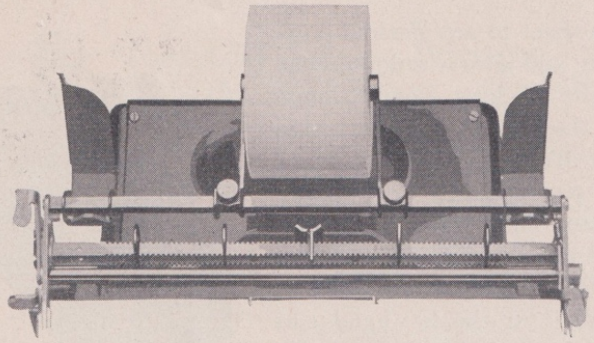


Figure 26
The Tabulator Stops are instantly adjustable to match your forms

the vertical notch in the tabulator latch. Repeat the operation for each of the other columns on the sheet.

Note that one of the stops is shorter than the others. It is secured to the tabulator bar and serves to locate the carriage centrally of the machine as required for printing on the narrow roll-paper. This stop is not intended to be moved.

Line Space Control Lever

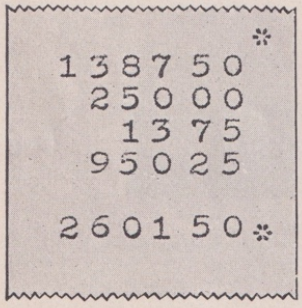


Figure 27
Single Line Spacing

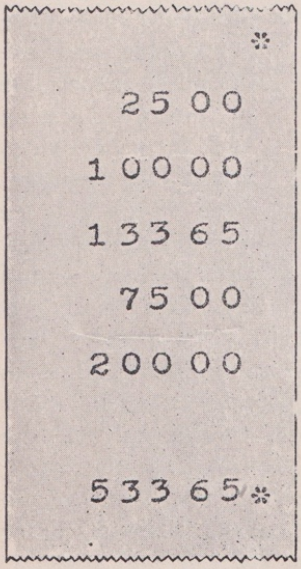


Figure 28
Double Line Spacing

The line space control lever is mounted at the right-hand end of the paper carriage and is adjustable for spacing the paper a single or a double line space and also for interrupting the line spacing entirely. On the side of the lever appears the following indexing: "0 2 1." For single spacing, push the lever back as far as it will go. In this position "1" will appear above the detent stud. Fig. 27 shows single spacing. For double spacing set the lever at its central position opposite "2." Fig. 28 shows double spacing. For non-spacing, pull the lever forward to its limit, when "0" will appear above detent stud. This is the adjustment for cross-footing. See next heading.

Do not attempt to change the adjustment of the line-space control lever after the operating handle has started forward.

Cross-Footing

To add items horizontally across a sheet, pull the line space control lever forward to its limit. This prevents the feeding of the paper. Move the carriage manually to the various columns as items are written, taking the total in the last column, thus:

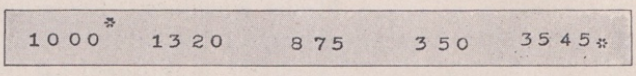


Figure 29
Cross-Footing

Tabulated Column Work

After insering a sheet of paper depress the tabulating lever, which is located on the right end of the carriage, and move carriage to the desired position. Then list the column of items in the usual manner. To list in the next column, turn back paper so that first item is just below top edge of ribbon, depress tabulating lever and move carriage to next column, and so on. The tabulating lever should be released as soon as the carriage starts to move. If the machine is provided with the Item Counter Tabulating Bell described under next heading, use it in work of this character, which it greatly facilitates.

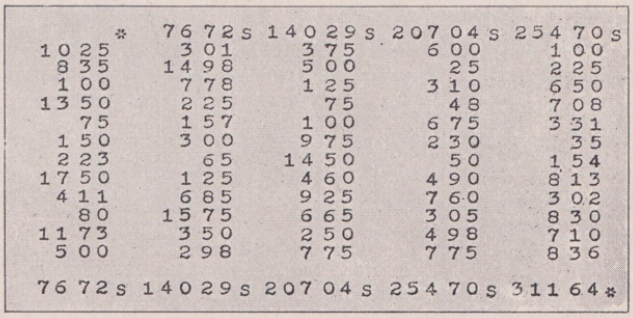


Figure 30
Tabulated Column Work

How to Use the Bell

The bell is mounted on the left-hand end of the paper carriage. On the bell proper appears a graduated scale running from 0 to 100. This is called the setting dial. A similar scale appears on the member located next to the paper carriage and known as the counting dial. The graduations on both scales are read at the forward edge of the index pointer. In Fig. 31 the item counter tabulating bell mechanism is shown with both the setting dial and the counting dial set at zero, indicated by "0" appearing on each just in front of the index pointer.

The bell and its associated mechanisms have some extremely useful and important functions. The following, for instance, will be found very simple to learn and apply:

(*a*) As an item counter, affording a direct-reading, visible register of the number of amounts that have been listed.

(*b*) For automatically maintaining a common starting point when listing parallel columns of figures.

(*c*) For giving a signal to indicate when a predetermined number of items have been listed as required in listing figures in parallel columns of uniform length.

(*d*) For giving a signal to indicate that a predetermined location on the page (as the bottom of the printing field) has been reached, regardless of the number of items.

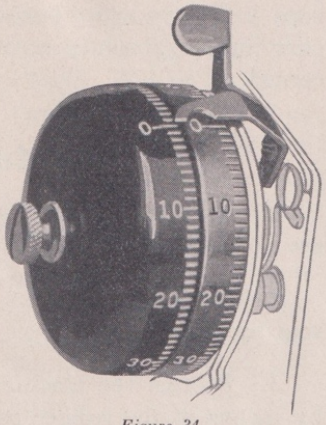


Figure 31
Reading always direct—No mental computation required

To Set Bell in Operative Position

When not required, see that the bell mechanisms are disengaged, which is done by moving the item counter control lever forward. To set the bell and item counter in operative position, first turn the platen to the exact position at which it is desired to start the work and then push back item counter control lever, thus placing the mechanisms in gear. While holding the lever in this position, place the hand on the right-hand platen twirler and turn platen forward one or two line spaces, *then push in on the twirler until it limits* and, holding it in this position, turn the platen back until it also limits. The counting dial will now be at "0."

When using the bell and counter always see that the line-spacer control lever is adjusted for single spacing, *i. e.*, pushed all the way back.

(a) To Count the Items Listed

First print clear sign and then place the counter in engagement as above explained. If the setting dial be not at "0," pul out the knurled knob at the center of the bell as far as possible and turn it until "0" appears at the front edge of the index pointer and then release the knob. Now, as the listing proceeds the number of items will be shown (directly and without any mental computation) on the counter dial just in front of the index pointer. When the number reaches 100 the bell will ring. The operator should then place a little mark of some kind against the 100th item, or register it in some other convenient way as by placing a tally mark on a piece of paper. When the list has been completed count the marks or tallies for the even hundreds, to which add the figures registered on the counting dial. If desired, the number of the items in the list may be printed, with non-add key depressed, just after the total. See Fig. 32.

The number of items in a list already printed may be quickly ascertained in the following manner: Reinsert the tape in the machine, turning platen until the first item appears just above the ribbon. Then set bell and counter in operative position as already explained. Now, as the platen is turned forward manually the bell will signal for every hundred items. Keep count of the signals, and when the platen has been turned so that the last item of the list appears just above the ribbon the even hundreds plus the number shown by the counter dial will be the total number of items in the list.

1050	1320	83	833	845
775	765	300	1140	1375
250	509	86	2260	255
2665	1025	1145	875	600
945	675	350	200	1435
146	148	1330	2500	675
1498	1310	798	1500	1300
975	650	560	687	441
100	250	1225	1325	680
75	220	100	475	375
125	1300		1325	298
1500		5977*	1000	450
375	8172*	10v	1425	1000
2000	11v			73
			15545*	
12479*			13v	9802*
14v				14v

Figure 32
The number of items may be printed under the total

(b) For Locating Starting Point

Turn the platen to the exact place at which it is desired to begin the columns. Set bell and counter in operative position as already directed. When the first column has been listed hold item counter control lever back with the left hand (to guard against it being accidentally forced out of position) and turn back the platen until it limits. This brings the counting dial again to "0." After moving the paper carriage to the next column, proceed as before. Continue in this way until all the columns are listed. The tops of all the columns will be in perfect alignment. See Fig. 33.

375	125	100	1425	73
1500	650	1225	1000	1000
125	1310	650	375	450
75	148	798	475	298
100	675	1330	1325	375
975	1023	350	687	680
1498	590	1145	1500	441
46	760	86	2500	1300
925	1320	300	200	675
1665		83	875	1435
1250	6601*		2260	600
775		6067*	1140	255
1050			833	1375
				825
10359*			14595*	
				9782*

Figure 33
Impossible to start a column wrong

(c) To Determine When the Desired Number of Items Have Been Listed

After locating the starting point as just explained, if it be desired to limit each column to a definite number of items, pull out the knurled knob on the bell or setting dial to its limit, turning it until the number of items desired appears at the index pointer, and then release it. If the setting dial be placed at 10, for instance, on the 10th operation of the handle the bell will ring. With the left hand holding item counter control lever, the platen is then turned back to the starting point, where it is automatically stopped.

The paper carriage is then tabulated in the manner already explained. See Fig. 34.

*	*	*	*	*
10 25	8 35	10 00	35 00	5 00
3 75	10 00	2 25	1 10	4 40
16 80	6 65	75	6 65	65
4 45	2 05	8 45	4 00	15 40
1 00	7 93	1 33	8 45	6 82
75	13 00	17 00	25 00	50
13 50	3 00	14 50	1 30	8 87
25 75	6 85	1 23	75	3 15
3 01	14 98	7 78	2 28	1 57
26 80	7 73	16 45	33	5 05
106 06*	80 54*	79 74*	84 86*	51 41*

Figure 34
The bell gives warning when a desired number of items have been listed

(d) Signaling When Bottom of Page is Reached

The starting point having been located as previously explained, turn the platen forward until the line on which the last item is to be printed is just above the top of the ribbon. Now observe the reading on the counter dial and by means of the knurled knob pull out and move the setting dial so that the same number will register at the index pointer. Then place the left hand on the item counter control lever and with the right turn platen back until its movement is automatically arrested at the starting point. Now proceed with the listing. Upon the operation of the handle which prints the item at the predetermined line at the bottom the bell will ring, when the listing of items will of course be discontinued.

Making Carbon Copies

Carbon sheets are used exactly as on a typewriter. When specified on the order the machine, before leaving the factory, will be provided with hammer springs of extra strength so that several clear carbon copies may be made. It is not desirable to do this unless the carbon work is contemplated, for the stronger the type springs are made, the greater will be the wear on the printing ribbon.

As the character of every operation of the Super Model Dalton is indicated by the printed symbols (Total, Sub-Total, Subtraction and Non-Add), a carbon copy will serve every purpose of the original in so far as carrying an absolute record of the operations is concerned.

Helpful Hints

1. See that multiplication key and non-print key are not locked down.

2. See that line-space control lever is set for line-spacing desired.

3. Protect the machine from dust when not in use by means of the rubber cover.

4. Always make a blank or spacing stroke before trying to print a total or sub-total.

5. Always print the clear sign (*) before you start any kind of work on the machine.

6. Always use the right hand for operating the handle and depressing the numeral keys.

7. In printing a grand total be sure that you do not let the thumb touch the sub-total key.

8. See that machine is not split unless the work in hand requires it. (See "Splitting the Machine," on page 28.)

9. After an interruption, before resuming operation see that keyboard clear signal shows blank or clear or—what serves the same purpose—fully depress the correction key.

10. Learn the Touch Method. A few minutes a day conscientiously devoted to the lessons appearing on the final pages of this book will make you a Touch Operator, and your speed and accuracy will continue to increase with practice.

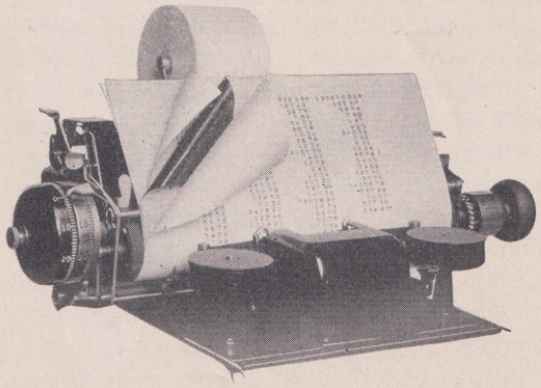


Figure 35
Makes Carbon Copies Like a Typewriter

Addition

To list and add: First clear the machine. Depress the numeral keys in the same order that you would write the figures with a lead pencil. When an item has been set up pull the lever. Pay no attention whatever to decimal or numerical order, as the machine performs this function automatically. Units will always be placed under units, tens under tens, etc., without the least thought or care on the part of the operator.

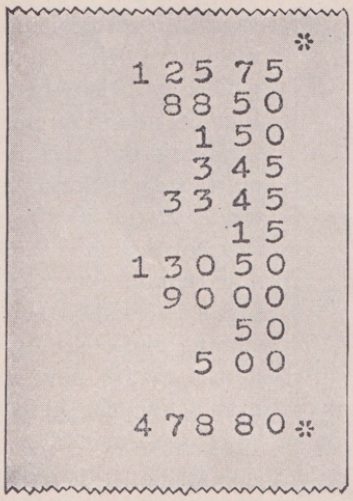


Figure 36
Addition

To list and add the amounts shown in Fig. 36: Clear the machine, printing the clear sign (*). Depress keys 1, 2, 5, 7 and 5 and pull lever. Depress keys 8, 8, 5 and 0 and pull lever. Continue in this manner until all the items are listed and printed. Then take a total.

Addition of Decimals

Determine in advance just how many places in the machine will be devoted to decimals and then as each item is listed see that it is set up to conform to the decimal point as established. For instance, suppose we determine to fix our decimal point between the third and fourth places counting from the right, which would mean three places for decimals: In listing an item having only two figures to the right of the decimal point, strike another cipher to make three, and with a number having four or more figures beyond the decimal point, set up the *first three*, ignoring the remainder. A whole number having no decimal would be struck on the keys followed by three ciphers.

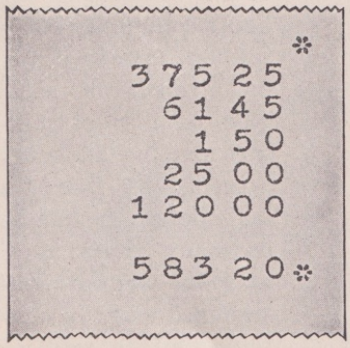


Figure 37
Addition of Decimals

For illustration, let us take the following: 37.525, 6.145, .15, 2.5, 12. As listed on the Super Model these items would appear as shown in Fig. 37, three places being allowed for decimals.

Addition of Common Fractions

When common fractions are encountered either in connection with whole numbers or separately, use their decimal equivalents. The accompanying table will be found convenient in this character of work. Watch the decimal point closely as explained under "Addition of Decimals."

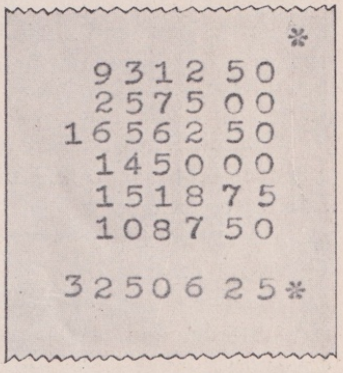


Figure 38
Addition of Common Fractions

Let us take for illustration the following: $93\frac{1}{8}$, $25\frac{3}{4}$, $165\frac{5}{8}$, $14\frac{1}{2}$, 15–3-16, $10\frac{7}{8}$.

We observe that the decimal representing one of these fractions (3-16) requires four places. We must therefore fix our decimal point between the fourth and fifth places from the right. After striking the 9 and the 3, we strike 125, representing the decimal for $\frac{1}{8}$ as shown by the table, and add a cipher to make four decimal places. For the next item, we strike the 2 and the 5 and then the 7 and 5 for the fraction $\frac{3}{4}$, followed this time by two ciphers to make the required decimal places. We proceed in like manner with the remaining items and the list, when completed, will appear as shown in Figure 38.

Decimal Equivalents of Common Fractions

	6ths	7ths	8ths	9ths	11ths	12ths	13ths	14ths	15ths	16ths
1.	.1667	.1429	.125	.1111	.0909	.0833	.0769	.0714	.0667	.0625
2.	.3333	.2857	.25	.2222	.1818	.1667	.1538	.1429	.1333	125
3.	.5	.4286	.375	.3333	.2727	.25	.2308	.2143	.2	.1875
4.	.6667	5714	.5	.4444	.3636	.3333	.3077	.2857	.2667	.25
5.	.8333	.7143	.625	.5556	.4545	.4167	.3846	3571	.3333	.3125
6.		.8571	.75	.6667	.5455	.5	.4615	.4286	.4	.375
7.			.875	.7778	.6364	.5833	.5385	.5	.4667	.4375
8.				.8889	.7273	.6667	.6154	.5714	.5333	.5
9.					.8182	.75	.6923	.6429	.6	.5625
10.					.9091	.8333	.7692	.7143	.6667	.625
11.						.9167	8462	.7857	.7333	.6875
12.							.9231	.8571	.8	.75
13.								.9286	.8667	.8125
14.									.9333	.875
15.										.9375

	3rds	4ths	5ths
1.	.3333	.25	.2
2.	.6667	.5	.4
3.		.75	.6
4.			8

Addition Beyond Capacity of Machine

Although the adding capacity of the machine may be ample for all ordinary purposes so that replacement by one of larger size might not seem justified, the necessity may arise now and then for handling amounts larger than can be printed on the machine. This may be done in the following manner:

Assuming the machine has a capacity of nine figures, and it is required to find the sum of a list of items containing as many as, say, 10 or 12 figures: Take a rule or other straight-edge and cover up the left-hand portion of the amounts, leaving exposed, let us say, only the seven right-hand figures of the items. After clearing the machine, list the exposed figures and then take a grand total. The seven figures of the total standing immediately below the partial items that were listed will be the seven right-hand figures of the complete total, and any figure or figures to the left of these should now be struck on the keys and listed as an item to be carried into the left-hand section of the addition. After this has been done move the straight-edge so that it will cover the seven right-hand figures previously listed. Proceed then to list the left-hand figures of the items now exposed, after which take another grand total, which, with the seven right-hand figures of the first total annexed, will be the complete total of the list of items. Study the example shown in Fig. 39 and its solution shown in Fig. 40.

```
1 3 2 8 7 5 1 9 2 8 3 7
  4 8 5 0 2 8 3 7 2 6
        3 7 4 6 1 5
    9 2 5 5 5 6 4 0 3
  1 1 5 0 6 4 7 3 8 2
      1 2 7 3 8 2 7 1
```

Figure 39
Amounts Beyond Capacity of Machine

```
                    *
    5 1 9 2 8 3 7
      2 8 3 7 2 6
      3 7 4 6 1 5
    5 5 5 6 4 0 3
      6 4 7 3 8 2
    2 7 3 8 2 7 1

1 4 7 9 3 2 3 4 *
            1
      1 3 2 8 7
        4 8 5
          9 2
      1 1 5
            1

      1 3 9 8 1 *
```

Figure 40
Showing Addition of Amounts in Preceding Example

It goes without saying that this is a mere expedient. If amounts which are beyond the capacity of your machine are encountered frequently, it would doubtless be an economy to get a larger capacity machine.

Addition of Compound Numbers

For handling employees' time cards, for instance, where the items are in hours and minutes, the machine may be split (see instructions for splitting on page 28) between the fifth and the sixth sectors counting from the right, which will leave the four left-hand sectors for hours and the five on the right for minutes. After striking keys for the hours there will remain five more places to be filled. Assuming there are two figures in the minutes, first strike the cipher key three times. When the items comprising hours and minutes have been listed in this way, print the subtotal, which will consist of the separate sums of the hours and minutes. If the sum of the minutes be sixty or more, as will probably be the case, transfer the hours represented by the total of the minutes to the hours column by striking on the keys the complement of sixty (the number of minutes making an hour) preceded by three 9's and operate the handle as many times as it may be mentally determined sixty is contained in the total of the minutes. Finish with a grand total which will show the total hours and minutes properly expressed.

```
                    *
      6       1 5
      8
      7       3 0
      7       4 0
      4       1 0
      5       5 0

    3 7     1 4 5 S
        9 9 9 4 0
        9 9 9 4 0

    3 9       2 5 *
```

Fig. 41
Hours and Minutes

```
                    *
      4 5       1 3
    1 1 5         4
      7 8       1 4
      2 8         7
      6 8
      7 3         4
    6 9 0         8
      5 4       1 1
      8 1         6
      2 2       1 0

  1 2 5 4       7 7 S
        9 9 9 8 4
        9 9 9 8 4
        9 9 9 8 4
        9 9 9 8 4

  1 2 5 8       1 3 *
```

Figure 42
Pounds and Ounces

It is obvious that the same method may be employed in handling other compound numbers such as bushels and pounds, feet and inches, pounds and ounces, tons and pounds, to mention no others. Figs. 41 and 42, in connection with the foregoing explanation, will be easily followed.

Subtraction

First clear the machine. List the minuend (the number from which another is to be taken) as for addition. Write the subtrahend (the number to be subtracted) on the keyboard but before operating the lever depress the non-add key, holding it down until the forward stroke is completed. The subtrahend now will be designated by the character "v," indicating that it has not been added into the total. Now re-write the subtrahend, this time using the *red* figures on the keys. Depress the subtraction key and operate lever. The subtrahend will now be further designated by the sign of subtraction (—) just below the (v), thus, (v̲). This now indicates that the amount has been subtracted. The total is then taken as in addition. In Fig. 43 245.79 is the minuend from which the subtrahend (130.68) was subtracted and 115.11 is the remainder and is designated by the clear sign (*).

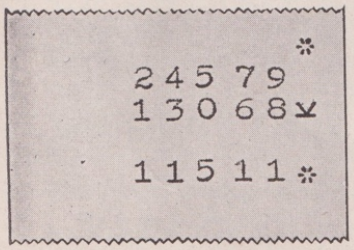


Figure 43
Subtraction

Subtraction of Common Fractions

When common fractions occur in either minuend or subtrahend set them up in the machine by striking keys for their decimal equivalents. A table showing the decimal equivalents of the common fractions most frequently encountered is shown on page 17, under "Addition of Common Fractions." Be careful that the same number of decimal places appear in both minuend and subtrahend as set up for subtraction.

EXAMPLE: From 93⅛ subtract 26¾. By reference to the table of decimal equivalents, we write the minuend as 93.125 and the subtrahend as 26.750, the final cipher being added to the subtrahend in order to make the number of decimal places equal to those of the minuend. See Fig. 44.

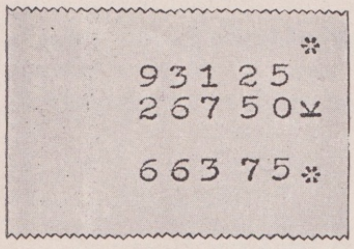


Figure 44
Subtraction of Common Fractions

Subtracting an Item After Others Have Been Listed

To subtract and indicate an erroneous amount after other items have been listed (see "Correction of Errors—By Subtraction Key," on page 11), turn back the platen until the amount to be subtracted is just above the top of the ribbon. Then re-write the erroneous amount on the keyboard, striking the keys with reference to the *red* figures. Depress subtraction key and operate lever. The amount subtracted will be designated by the subtraction sign (-), which indicates that, although the amount was added, it was later subtracted and is not included in the total. After the platen has been turned forward so that the last item printed appears just above the ribbon, addition may be resumed. In Fig. 45, 36.07 was erroneously added and then subtracted in this manner.

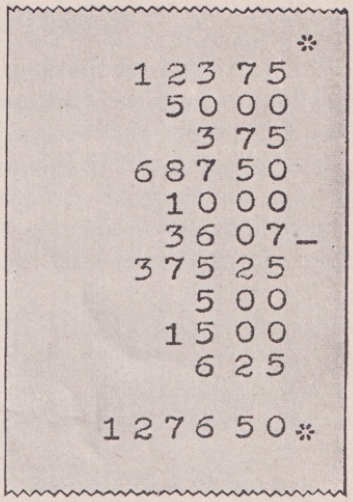


Figure 45
Subtracting an item after others have been listed

Multiplication by Subtraction

In finding the product of two numbers, one of which is slightly less than 100, 1000, 10000 or some other even power of 10 as, say, 98, 997, 9995, etc., a labor-saving expedient is to set up the figures of the other factor in the machine and then add as many ciphers as there are in the power of 10 which the first mentioned factor most nearly approaches. Now again strike the figures for the number that was printed *without the added ciphers*, however, and this time according to the *red* figures on the keys. Depress *both* the multiplication and the subtraction keys and, holding them depressed and beginning with the number next larger than the multiplier, count up to and including the even power of 10, operating the lever for each unit counted. After the final stroke release the multiplication and subtraction keys, being sure that the subtraction key returns to normal position. Then depress correction key and print the total, which will be the product of the multiplication. This expedient will be of great assistance in such work as deducting cash discount to show the net amount, to mention no other examples.

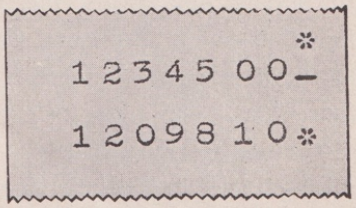
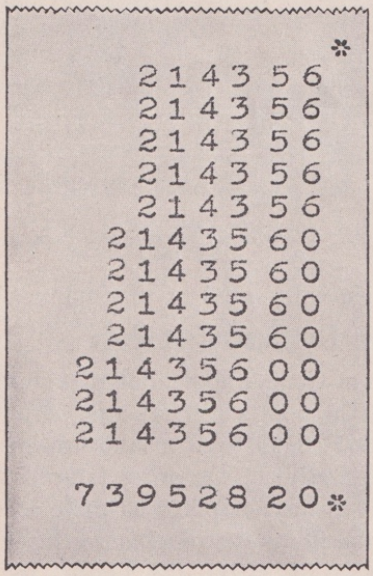


Figure 46
Deduction of 2 Per cent

Fig. 46 shows a deduction of 2% from $12,345.00 (net $12,098.10). But three handle operations, aside from those made in printing the total, were required. Care must be exercised to be sure that the proper keys are operated, as there is no opportunity to check the work from the machine tape. Although much shorter than the regular multiplication, it is open to some of the uncertainties attaching to the work of non-listing machines.

Multiplication

To multiply on the Super Model, first see that the machine is clear and then push down the multiplication key and by a slight rearward pressure, lock it in its depressed position. Depress on the keyboard keys representing the figures of the multiplicand (or number to be multiplied). Now operate the lever as many times as there are units in the right-hand figure of the multiplier. Then depress the cipher key, after which operate the lever as many times as there are units in the second figure of the multiplier, and so on until the last or left-hand figure of the multiplier has been used. Then depress the correction key to its full extent of movement, make a blank or spacing stroke and take a grand total, which will be the product.



Figur e 47
Multiplication — Example No. 1

EXAMPLE NO. 1: Multiply 214356 by 345. See that machine is clear and depress and lock down the multiplication key. Operate the numeral keys for 2, 1, 4, 3, 5 and 6. Operate the lever five times, being once for each unit in the units digit of the multiplier, and then depress the cipher key, which has the effect of moving the figures of the multiplicand already in the machine over to the next higher numerical order. Operate the lever four times, being once for each unit in the second digit of the multiplier. Strike the cipher key as before, thus raising the multiplicand to the next higher numerical order, and operate the lever three times, being once for each unit in the third digit of the multiplier. After this has been done depress correction key, make one complete blank or spacing stroke and then take a grand total the same as in addition, which will be the product. See Fig. 47.

If the multiplier end with ciphers to the right, it will be necessary to add an equal number of ciphers to the multiplicand before operating the lever. If intermediate ciphers appear between the figures of the multiplier, it will be necessary in passing to the next higher order to depress as many *additional* ciphers as there are intermediate ciphers in the multiplier.

EXAMPLE NO. 2: Multiply 214356 by 3050. With the machine clear and multiplication key locked down, depress the figures on the keyboard representing the multiplicand 214356 as for ordinary addition. It will be noted in this instance that the right-hand figure of the multiplier is a cipher. Before operating the lever, therefore, depress the cipher key, thus raising the multiplicand to the next higher numerical order. Then operate the lever five times, being once for each digit in the second figure of the multiplier; then depress a cipher, which carries the figures of the multiplicand into the hundreds column. Now, as the figure in the hundreds column in the multiplier is a cipher, the lever must not be operated at this point, but the cipher key must be depressed again to bring the figures of the multiplicand into the thousands column. Then operate the lever three times, depress correction key, make a blank spacing stroke and take a grand total, which will be the product. See Fig. 48.

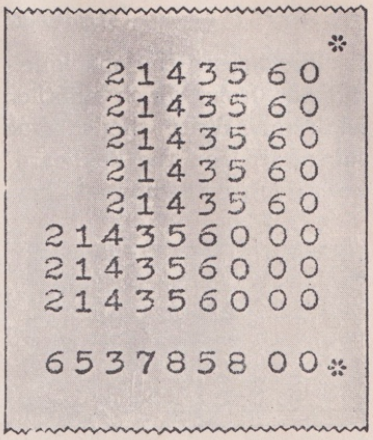


Figure 48
Multiplication — Example No. 2

Multiplication when done in this manner is very rapid; and inasmuch as each operation is listed, it leaves a physical record of the work, which can be audited at a glance. From Fig. 47 it is quickly seen, for instance, that the multiplicand was 214356 and that it was multiplied three times in the hundreds column, four times in the tens column and five times in the units column. The sum of the partial products must of necessity be the product.

Multiplication by Fractions

When a common fraction appears in either multiplicand or multiplier reduce to its decimal equivalent and multiply as in ordinary multiplication, always remembering to point off as many decimal places in the product as there are in both multiplicand and multiplier. See table of decimal equivalents appearing under "Addition of Common Fractions" on page 17, and also on pages 43 and 44.

EXAMPLE No. 1: 235¼ x 34⅛. First clear the machine and lock down multiplication key. 235¼ equals 235.25 and 34⅛ equals 34.125. Strike 235.25 on the keys in the ordinary way and make the multiplication by 34.125 in the manner already explained. There

are two decimal places in the multiplicand and three in the multiplier, making five in all. Therefore, point off five places in the product, which gives us 8027.90625. This example is shown completely worked out in Fig. 49.

Common fractions which cannot be made into complete decimals when occurring in either multiplicand or multiplier may be handled by running out one or more additional places, according to the degree of accuracy required.

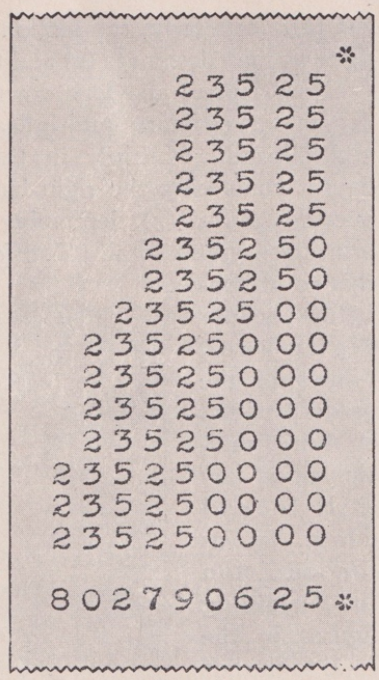


Figure 49
Multiplication by Fractions

Multiplication Beyond the Capacity of the Machine

First Method

EXAMPLE: Multiply 214356 by 6123. There being six figures in the multiplicand and four in the multiplier, as many as ten figures may be required in the product—too many to be printed in a machine of nine figures capacity. A simple expedient, however, will permit such multiplication to be performed and the exact product secured.

First see that the machine is clear and lock down multiplication key. Then set up all the figures of the multiplicand except the last one on the right. Multiply in the regular way by the right hand figure of the multiplier. Instead of spacing over with the cipher key, however, strike the key representing the right-hand figure that was omitted from the multiplicand. Multiply by the second figure of the multiplier and proceed from this point on just as directed for regular multiplication, using the cipher for spacing over. When all the figures of the multiplier have been used and correction key depressed, before printing the product release multiplication key and multiply (mentally) the right-hand figure of the multiplicand (6), which was omitted in the first instance, by the right-hand figure of the multiplier (3). If the product contain two figures (as it does in this case), add the left-hand figure to the amount already in the machine by striking the proper key (1 in this instance), print the total and then with a pen or pencil write the right-hand figure of the product just mentioned immediately to the right and as a part of the total as printed by the machine. The total, so enlarged, will constitute the complete product of the multiplication. See Fig. 50.

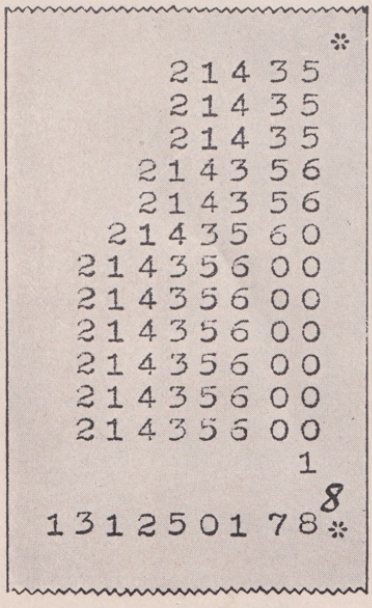


Figure 50

Second Method

EXAMPLE: Multiply 1,194,743 by 214,352. First see that the machine is clear. Strike keys for the multiplicand and while holding down the non-add key operate the handle. Then in like manner set up the figures of the multiplier and with non-add key hold down again operate the handle. Both factors of the multiplication will now be printed followed by the non-add sign (v), indicating that they have not been added. Now begin at the right-hand figure of the multiplier and count to the left until all the figures of the multiplier have been counted and continue counting, beginning at the left of the multiplicand, until the total figures thus counted, including those in the multiplier, reach nine. Place a dot over the ninth figure. (NOTE: If a Dalton of only seven figures capacity, put the dot over the seventh figure.) List in the machine preparatory for multiplication in the usual way the figures of the multiplicand *to the left of and including the dotted one.* Multiply the figures just listed by the right-hand figure of the multiplier in the usual way; but instead of spacing over with the cipher key, strike the key representing the figure immediately to the right of the one with the dot over it, which in this instance is a 4. Now multiply by the

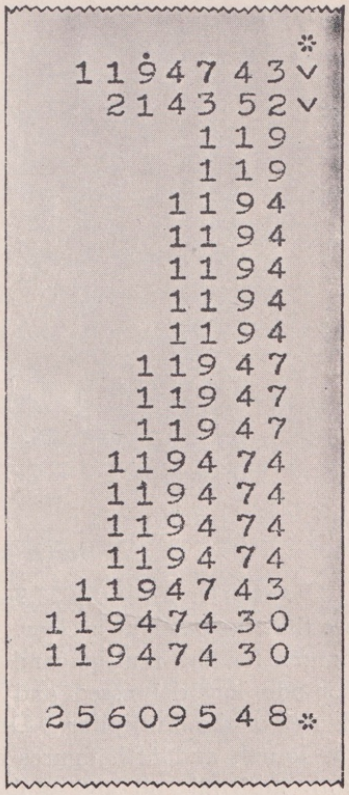


Figure 51

second figure of the multiplier, after which space over by using the figure in the multiplicand to the right of the one just used. Continue in this way until all the figures of the multiplicand to the right of the dot have been used, after which the cipher must be used for spacing as in ordinary multiplication. See Fig. 51.

NOTE: This process cannot be depended upon always to afford accuracy in the final figure of the product. When absolute accuracy is required one of the other methods should be employed.

Third Method

EXAMPLE: Multiply 814,956 by 314,152. First see that the machine is clear and lock down multiplication key. List all the figures of the multiplicand in the customary manner for multiplication, multiply by the three right-hand figures of the multiplier, depress correction key and take a grand total, the three right-hand figures of which will be the three right-hand figures of the grand product. With multiplication key still locked down, list the figures to the left of the three figures just referred to as in ordinary addition, operate the lever, and again depress correction key. Now list as before all of the figures of the multiplicand and multiply them this time by the three remaining figures of the multiplier, again depress correction key and take another grand total. This total, together with the three right-hand figures of the first product, is the complete product. See Fig. 52.

```
                    *
      814956
      814956
    8149560
    8149560
    8149560
    8149560
    8149560
  81495600

 1238733 12*
    123873
    814956
    814956
    814956
    814956
   8149560
  81495600
  81495600
  81495600

 25602005 7*
```

Figure 52

Fourth Method

EXAMPLE: Multiply 73,948,749 by 20,314,231. First see that the machine is clear. Introduce on the keys the figures for the multiplicand and print them with the non-add key depressed and in like manner print the figures of the multiplier. Draw a vertical line between the fourth and fifth figures counting from the right of both multiplicand and multiplier. This will separate each of them into two sections. The section of the multiplicand on the right of the vertical line we shall for convenience designate (*a*) and the section on the left (*b*). Similarly, the section of the multiplier on the right we may designate (x) and the section on the left (y).

Now depress and lock down multiplication key and list as for ordinary multiplication section (a) of the multiplicand. Multiply in the ordinary way by the figures composing the right-hand section of the multiplier designated (x), depressing correction key and then printing a grand total. The four right-hand figures of this total constitute the four right-hand figures of the grand product.

With multiplication key still locked down, list as for addition the remaining figures in the total to the left of the four, as they are to be carried over into the next product as described in the THIRD METHOD, and operate the lever, after which again depress correction key. Below the figures just listed print the figures of the left-hand section of the multiplicand designated (b) and multiply in the ordinary way by the four right-hand figures of the multiplier designated as (x), and once more depress correction key, but without taking a total. Now list for multiplication section (a) of

```
                    *
(b) 7394|8749 v (a)
(y) 2031|4231 v (x)
        8749
       87490
       87490
       87490
      874900
      874900
     8749000
     8749000
     8749000
     8749000

 3701 7019*
      3701
      7394
     73940
     73940
     73940
    739400
    739400
   7394000
   7394000
   7394000
   7394000
      8749
     87490
     87490
     87490
    874900
    874900

 4905 6934*
      4905
      7394
     73940
     73940
     73940
   7394000
   7394000

 1502219*
```

Figure 53

the multiplicand, multiply by the figures of section (y) of the multiplier, again depress correction key and then print a grand total, the four right-hand figures of which will constitute the second section of the grand product, and those on the left the carry-over figures into the next product, as before.

Again list the carry-over figures from the last operation and depress the correction key. Below the figures just printed list for multiplication section (b) of the multiplicand. Multiply the latter by section (y) of the multiplier, again depress correction key and print another grand total, which, together with the four right-hand figures from each of the two previous operations, constitutes the grand product, and is correct to the final figure. See Fig. 53.

Multiplication from Left to Right

The preceding instructions follow the method of multiplication we learned at school, the digits of the multiplier being used in sequence beginning with the right-hand or units order and proceeding to the left. It is just as easy with the Super Model, however, to commence with the left-hand or highest order of the multiplier and proceed from left to right. In large multiplications involving decimals where there are final figures to be discarded (as, for instance, in performing division by use of reciprocals) this method is much to be preferred over the Right-to-Left Method.

EXAMPLE: Multiply 423,456 by .4123. After clearing machine and locking down the multiplication key, in order that the full capacity of the machine may be utilized, strike on the keys the figures of the multiplicand followed by ciphers, if necessary, until the registry of the machine be completely filled (9 figures, if that be the capacity of the machine) and then depress the back-space key. (A rule for limiting the set-up of the multiplicand to economize machine operations when possible, permitting the calculation to be carried only to the degree of accuracy required in the product, is given under the next heading.) Now operate the handle four times being once for each unit in the left-hand figure of the multiplier. Instead of spacing over with the cipher key as directed in the previous instances, use the back-space key. Proceed in this way with each figure of the multiplier until the right-hand or lowest order is reached, or until all the figures of the multiplicand have been dissipated, remembering to depress the correction key as in ordinary multiplication just before making the clearing stroke preparatory to taking the total. See Fig. 54.

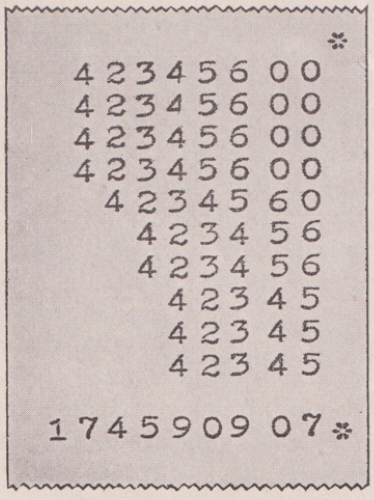


Figure 54

The total or product being printed, point off as many decimal places as there are decimal places in both the multiplicand and multiplier, less the number of figures that may have been omitted from the multiplicand *as last listed*. In this instance there are four decimal places in the multiplier and none in the multiplicand. As last listed, the multiplicand is seen to be 42,345, showing that one figure has been omitted. Four, less one, makes three decimal places to be pointed off.

Predetermining the Decimal Point in Multiplication

In the process of Multiplication from Left to Right, as explained under the preceding heading, the number of figures in the product is controlled and determined by the number of figures appearing in the original set-up of the multiplicand. There is an easy and simple method whereby advantage may be taken of this fact for the attainment of many important ends as, for example, the following:

(*a*) Making sure that a calculation is extended *far enough* to provide the degree of accuracy required, or disclosing at once that it is beyond the capacity of your machine.

(*b*) Limiting the computation so that not a single operation may be wasted in producing a *surplus* of figures in the product merely to be discarded.

(*c*) Determining the location of the decimal point in advance so that the product when secured may be pointed off without hesitation or uncertainty.

(*d*) Standardizing the location of the decimal point for a number of multiplications, thus permitting them to be performed in series and a grand total of all printed at the end.

(*e*) The simple and automatic determination of the puzzling question so frequently arising when an extended decimal constitutes one of the factors as to *just how many* of the figures should be used.

You need only to determine how many decimal places you *want* in the product, and the rule takes care of all the rest.

RULE—Select the factor to be used as the multiplicand and strike on the keys the figures (if any) which stand to the left of the decimal point. Then determine in the following manner the

number of ADDITIONAL figures to be introduced to complete the set-up of the multiplicand:

Start with a number ONE LESS than the number of decimal places desired in the product and

(1) ADD the number of figures in the multiplier (if any) standing to the left of the decimal point;

OR, if the multiplier contain no figures to the left of the decimal point, then

(2) SUBTRACT the number of ciphers (if any) standing to the left of the first significant figure in the multiplier.

The result will be the number of numeral key operations still required to complete the set-up of the multiplicand. Should the number of ciphers to the left of the first significant figure of the multiplier EXCEED the number with which you started, instead of operating additional numeral keys, depress the back-space key once for each unit of such excess.

The multiplications in the example following have been selected, not because they are considered typical of multiplications usually encountered, but in order to illustrate the application of the rule to every possible condition which can be presented.

EXAMPLE: Find the sum of the products of the following multiplications *correct to the nearest cent*:

8213.65	x	.125
102.	x	3.978750309
7640.86	x	.0000321084
87.64873205	x	12.103
.0126743	x	2.11

Clear the machine. To be sure of accuracy in the cents, let us provide two additional decimal places, or four in all. Take the factor having the greater number of figures for the multiplicand. In the first multiplication this would be 8213.65. Strike on the keys the figures standing to the left of the decimal point (8213).

Now add to 3 (1 less than the number of decimal places to be shown in the product) the number of figures of the multiplier standing to the left of the decimal point. We observe there are none and that there is no cipher immediately to the right of the decimal point. Three, therefore, represents the number of figures still to be set up to complete the multiplicand. Proceed by striking the 6 and then the 5, and there being no further digits in the multiplicand, for the third figure strike a cipher. Now multiply by 125, using the method explained under "Multiplication From Left to Right," page 23. Depressing the correction key but without taking a total, proceed to the next multiplication. Select 3.978750309 as the multiplicand, striking the 3-key. There are three figures to the left of the decimal point in the multiplier. 3 plus 3 makes 6, signifying that there must be 6 more keys depressed to complete the set-up of the multiplicand. We therefore strike keys for 978750, ignoring the remaining figures. (They could never affect the cents in the product). Make the multiplication as before, and depress correction key. In the third multiplication strike keys for 7640. In the multiplier, not only are there no figures to the left of the decimal point, but we observe that there are four ciphers between the decimal point and the first significant digit, the number of ciphers exceeding 3 by 1. This signifies that there are already too many figures in the set-up of the multiplicand and that one of them must be canceled. This is done by depressing the back-space key once, after which make the multiplication, stopping, of course, when the figures of the multiplicand have been dissipated. Now after depressing correction key, for the next multiplication strike keys for the 87. We find two figures to the left of the decimal point in the multiplier. The sum of 3 and 2 is 5. Strike keys for five more figures of the multiplicand, ignoring in this case the 205. Complete the multiplication and depress correction key. In the next and last multiplication in the factor we select for the multiplicand as having the greater number of figures we find no figures to the left of the decimal point. As yet, no keys are therefore to be operated. In the multiplier there is a single figure to the left of the decimal point. 3 plus 1 is 4, signifying that keys are to be struck for the four left-hand figures of the multiplier, which we find are 0126, the remaining portion of the decimal being discarded as worthless. After making the multiplication and depressing correction key take a grand total, placing the decimal point as predetermined between the fourth and fifth places counting from the right. Study Fig. 55.

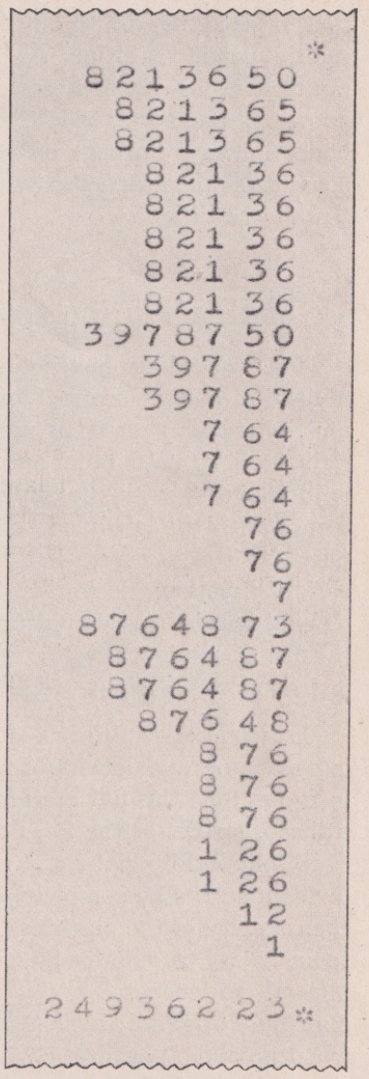


Figure 55
Much unnecessary labor is avoided by the omission of worthless figures from the computation

Should it be desired to have either a greater or a less number of decimal places in the product, substitute for 3 as used above some other number which would be *one less* than the number of decimal places desired.

Division

In division better results will usually be secured by the use of a table of reciprocals, such as the one published by this Company (see page 26 under "Division by Reciprocals"). Nevertheless, in the actual process of division the Super Model is a wonderful aid, taking away drudgery, guaranteeing mechanical accuracy in the result and at least doubling the speed of mental division.

To divide with the aid of the Super Model: Depress keys representing the divisor, depress non-add key and operate the lever, after which depress keys representing the figures of the dividend, printing it as in ordinary addition. Now depress keys to represent the *complement* of the divisor. (NOTE: The complement of a number is the difference between that number and a number represented by "1" with as many ciphers added as there are figures in the first number. Thus, 3 is the complement of 7, and 250 is the complement of 750, etc.) For reasons which will later appear it will be best to put in a "9" just before the figures of the complement. In order that it may be printed in the proper position with respect to the figures of the dividend to be dealt with, depress a sufficient number of ciphers to bring the right-hand figure of the complement under the right-hand figure of the *fewest* number of figures of the dividend, counting from the left, in which the divisor will be contained. Now, with the multiplication key locked down, operate the handle as many times as you may mentally ascertain the divisor will be contained in the selected portion of the dividend as above noted, after which depress correction key and then print a sub-total. The left-hand figure of the sub-total will be the first figure of the quotient and the figures to the right will be the remainder as in ordinary long division. Into this remainder the next division must be made. Now again set up the figures of the complement, adding *one cipher less* than before. Mentally determine how many times the divisor will be contained in the figures of the remainder standing above the figures of the complement, operating the handle the number of times indicated, after which depress correction key and print another sub-total. The two left-hand figures of the sub-total represent the first and second figures of the quotient and the figures to the right another remainder. Again strike the complement on the keys, omitting *still another cipher*, and continue with the process until there are no ciphers to the right of the complement. After the last operation, depress correction key and print a grand total, which will contain the figures of the quotient at the left with the remainder to the right, one or more ciphers intervening.

EXAMPLE No. 1: Divide 32681 by 25. First see that the machine is clear. With the non-add key depressed, print the divisor and then print the dividend as for ordinary addition, and then lock down multiplication key. The complement of 25 is 75, to which prefix a "9". It will now be seen that the divisor 25 will be contained in the *two* left-hand figures of the dividend. In order, therefore, to get the 975 into the proper numerical order it will be necessary, after setting it up on the keys, to strike the cipher key three times. The operator will now observe that 25 will be contained in the left-hand figures (32) of the dividend but once. The lever is therefore to be operated but a single time. Now depress correction key and then take a sub-total, the left-hand figure (1) of which is the left-hand figure of the quotient. The figures to the right (7681) represent the remainder of the dividend. Again set up the 975 followed this time by one less cipher than before. It will now be ascertained mentally that 25 will go into 76 three times. Operate the lever, therefore, three times, after which depress correction key and take another sub-total. The two figures at the left (13) comprise the first and second figures of the quotient and the figures 181 remaining to the right, the new remainder. Again set up the figures of the complement, which this time would require the addition of only one cipher. It will be noted, however, that 25 is not contained in the two left-hand figures of the remainder. Therefore, omit the cipher, leaving the figures of the complement under the entire remaining figures (181) of the remainder. It is now seen that 25 is contained in 181 seven times. Therefore print the complement seven times, depress correction key and follow with a *grand* total. The figures 1307 at the left are the quotient, with a remainder of 6. Follow the operations in Fig. 56.

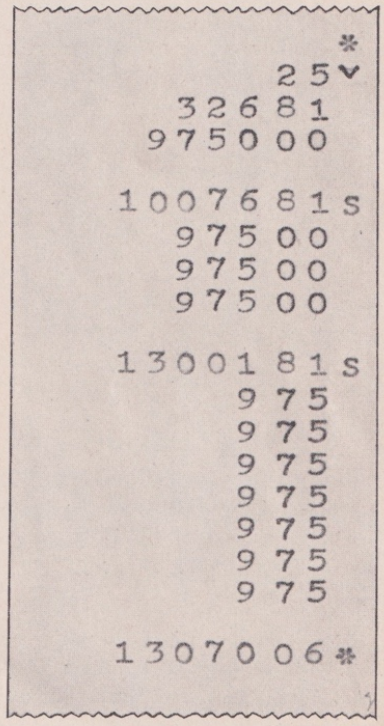


Figure 56
Division — Example No. 1

For the sake of clarity comparatively small amounts were used in the first example. With the Super Model Dalton, however, there is literally no limit to the size of a dividend which may be handled—ten, twenty and more figures, if required; and with a machine of nine figures capacity the divisor may run up into six figures.

EXAMPLE No. 2: Divide 1,843,889,865 by 7,863. Clear the machine. With non-add key depressed, print the divisor and then list as in ordinary addition the first seven figures of the dividend counting from the left. The complement of 7863 is 2137, to which, for the purpose of preserving separation between the figures of the partial product and the remainder, prefix a 9, striking the figures 92137 on the keys. It will at once be seen that it will require the five left-hand figures (18438) of the dividend to contain the divisor and that there will be two figures remaining to the right for which ciphers must be struck in order to bring the figures of the complement into proper relation with the five figures of the dividend necessary to contain the divisor. It will further be seen that the divisor will be contained in the left-hand five figures of the dividend only twice. Lock down multiplication key, operate the handle twice, depress correction key and print a sub-total. The remainder is 271289. It will be seen that the divisor will be contained in the left-hand five figures of the new remainder and that but a single cipher will be required to bring the complement, which should be struck on the keys as before, into proper relation with the five selected figures of the partial remainder. Into these figures the divisor will be contained three times. Therefore, operate the lever three times, depress correction key, and print another sub-total. Again strike on the keys the figures of the complement preceded by a 9. The remainder is now 35,399, and it will be observed that it will require *all* of the figures to contain the divisor. No cipher, therefore, is to be added. The divisor, we see, will be contained in the new remainder four times. Operate the lever four times and depress correction key. after which, instead of a sub-total, print a *grand* total. This represents three figures (234) of the quotient, with a remainder of 3947. Strike the figures of the remainder on the keys followed by the other three figures of the dividend (865) that were not included in the first set-up. Again strike the figures of the complement on the keys preceded by a 9 and insert the two ciphers which, it will be observed, are required to bring the complement into proper relation with the fewest figures at the left of the dividend into which the divisor will be contained, namely 39478. Into these figures it is seen the divisor will be contained five times. Operate the lever five times, depress correction key and take another sub-total. Once more introduce the figures of the complement preceded by a 9, no cipher being necessary, as it will require *all* of the figures of the remainder (16365) to contain the divisor. The figures, we observe, will contain the divisor twice. Operate the handle twice, depressing correction key and finishing with a grand total.

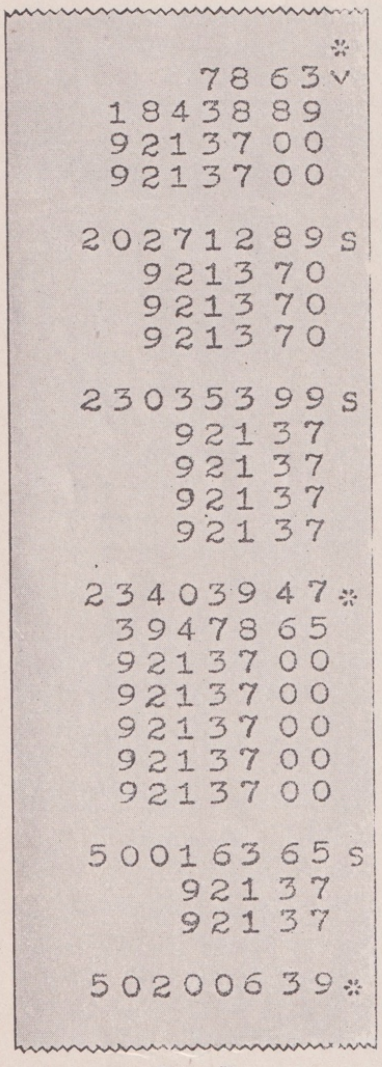


Figure 57
Division — Example No. 2

The three figures (234) at the left of the first grand total, together with the three figures (502) at the left of the grand total last taken, constitute the quotient 234502, and the remainder is 639. If necessary the division could be continued to an *unlimited number* of decimal places by continuing to introduce the remainder with ciphers added. Study carefully Fig. 57 in connection with the foregoing.

Division by Reciprocals

Division on the Super Model is performed simply, easily and quickly by use of reciprocals, whereby the actual process of division is changed to multiplication. The reciprocal of a number represents the number of times it is contained in unity or one. If we know the number of times a number is contained in one, by a simple multiplication we may find how many times it is contained in two—two hundred—two thousand—two million—or any other number. The fact that the reciprocal of a number larger than one will be a fraction (for convenience usually expressed decimally) in no way alters the condition, signifying only that instead of whole numbers, we deal with decimals extended to six, eight or more places.

The use of reciprocals for dividing is especially urged where the same divisor is employed successively or where its use is so frequent that the operator will either remember the reciprocal or have it written down for instant reference. Otherwise, a table must be consulted.

A table showing the reciprocals of numbers from one to eight hundred will be found on pages 46 and 47. A book containing reciprocals of numbers from one to ten thousand and sufficient for most commercial purposes is published by The Dalton Adding Machine Sales Company and will be sent to Dalton owners postage prepaid on receipt of the price of $1.00.

EXAMPLE No. 1: Divide 625 by 25. The reciprocal of 25 (expressed decimally) is .04. In other words, 25 is contained in one .04 times, from which it follows that it will be contained in 625 just 625 times .04. We, therefore, multiply the dividend, 625, by the reciprocal of the divisor (.04), pointing off the two decimal places in the result, which gives us the correct quotient, 25. See Fig. 58.

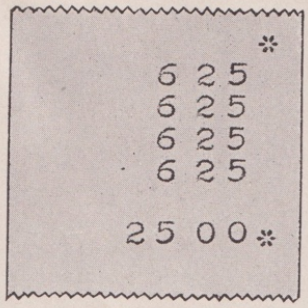


Figure 58
Division by Reciprocals
Example No. 1

EXAMPLE No. 2: Divide 1,843,889,865 by 7,863. From the Dalton Book of Reciprocals we find that the reciprocal of 7,863 is .0001271779. The dividend, which in this instance contains the larger number of figures, should be set up on the keys, discarding, however, in so doing all but nine figures in order that the problem may be handled on a nine-figure machine. Where the sum of the left-hand figure of the reciprocal and the left-hand figure of the dividend is five or more, no more than eight figures of the dividend should be introduced into a nine-figure machine. Having, of course, first cleared the machine, multiply by the figures of the reciprocal of the divisor using the method explained on page 23 under "Multiplication from Left to Right." After the proper number of decimal places have been pointed off, the product represents the quotient. Using reciprocals calculated to seven figures, accuracy in the result to the extent of five or six figures may be depended upon. See Fig. 59.

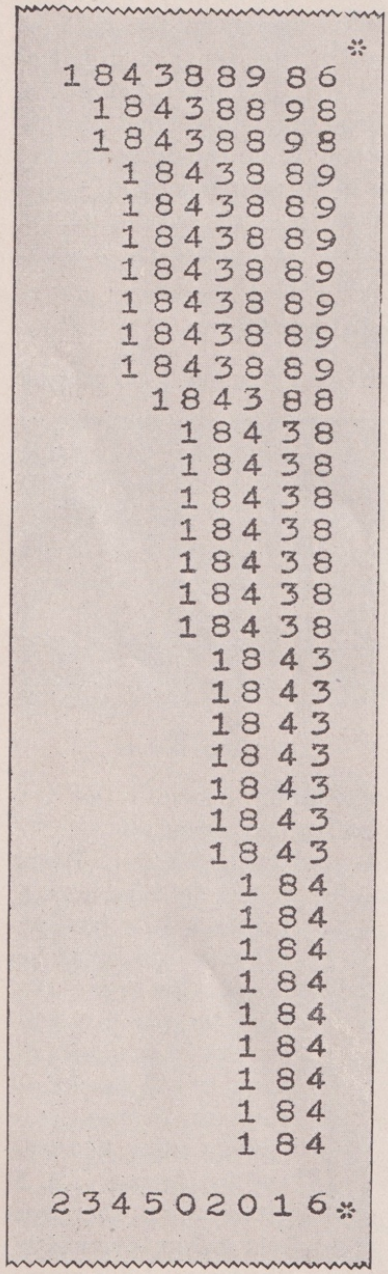


Figure 59
Division by Reciprocals
Example No. 2

Division by 9

This is an extremely simple and easy operation and will be found practical, not only in division by the number 9 itself, but by other numbers whose ratio to 9 may be expressed accurately in, say, not to exceed two or three figures.

EXAMPLE No. 1: Divide 123,450 by 9. Write the dividend in the machine in the ordinary way for addition, and in order to give a greater number of reliable places in the quotient, add ciphers to make a total of, say, eight figures, including those of the dividend itself. Now depress and lock down the multiplication key, strike the left-hand figure of the dividend on the keyboard and operate the handle. Strike the second figure of the dividend and again pull the handle. Proceed in this way until all the figures except the eighth or final figure on the right have been used. Then, after depressing the correction key, take a grand total, pointing off *one more* place for decimals than the dividend contains. The total will then be the quotient. See Fig. 60. A table showing a list of numbers with their ratios to 9 is here given:

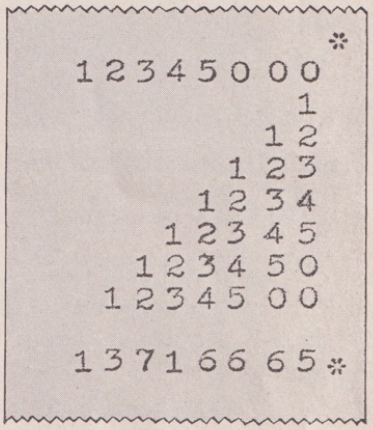


Figure 60
Division by 9 — Example No. 1

Number	Ratio	Number	Ratio
3	3.	450	.02
6	1.5	600	.015
12	.75	625	.0144
15	.6	720	.0125
18	.5	750	.012
24	.375	1125	.008
36	.25	1200	.0075
45	.2	1440	.00625
60	.15	1500	.006
72	.125	1800	.005
75	.12	2250	.004
120	.075	2400	.00375
144	.0625	3000	.003
150	.06	3600	.0025
180	.05	3750	.0024
225	.04	4500	.002
240	.0375	6000	.0015
300	.03	6250	.00144
360	.025	7200	.00125
375	.024	7500	.0012

EXAMPLE No. 2: Divide 123,450 by 225. By reference to the table we find that the ratio of 225 to 9 is .04. Set up the dividend with sufficient ciphers added to make, say, eight places in all, lock down multiplication key and make the multiplication by .04, ending with a *sub*-total. There are two decimal places in the dividend representing the added ciphers and we had two decimal places in the number representing the ratio. There will, therefore, be four decimal places to point off in the product, which now in turn is to be divided by 9 in the manner already explained. This operation results in still another decimal point, making five in all and gives as our quotient 548.66664, which is really 548.66–2-3, the final figure being incomplete. See Fig. 61.

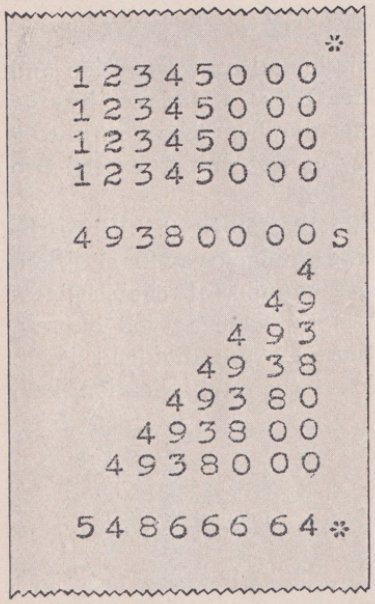


Figure 61
Division by 9 — Example No. 2

Splitting the Machine

Splitting the machine permits amounts to be printed in two columns at a single printing operation. In models which include this feature the number of splits regularly provided is two, one in the second and one in the fourth place, counting from the left.

To split the machine in the fourth place, raise the nickel-plated door in the front of the machine and push up to its limit the right-hand split lever. See pages 6 and 7. Splitting a machine having a capacity of nine figures thus permits the operator to list four figures to the left of the column split and five figures to the right. See Fig. 62. If less than five figures are to be listed in the second column, sufficient ciphers must be previously depressed to make the difference between the number of figures in the item to be listed and five.

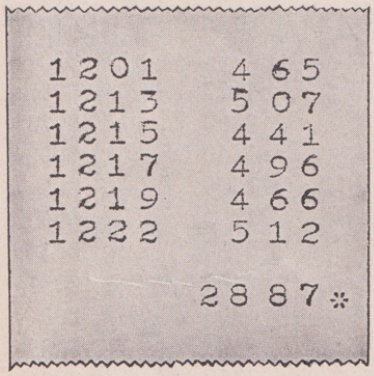


Figure 62
Machine Split in Fourth Place

This feature is useful in listing cost and selling price, bushels and pounds, feet and inches, hours and minutes, etc. See "Two Totals at Once" on page 28, and "Addition of Compound Numbers" on page 18.

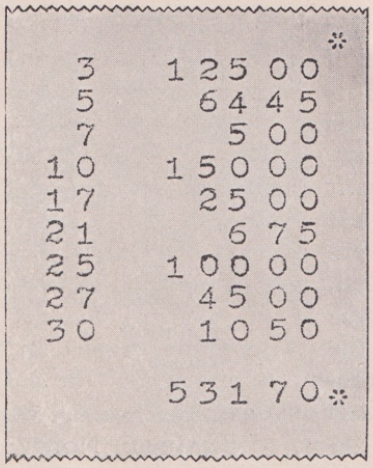


Figure 63
Machine Split in Second Place

Pushing up the left-hand split lever splits the machine in the second place. See Fig. 63. In a machine of nine figures capacity with this split adjustment there are two places to the left and seven to the right of the split; and if less than seven figures are to be listed in the right-hand column, enough ciphers must previously be set up to make up the difference between the number of figures in the item and seven. This is the adjustment required for printing the day of the month for statement or other work requiring a date. See "Making Statements" on page 29.

Two Totals at Once

The Dalton Super Model may frequently be utilized to advantage for listing cost and selling price, which can be done at a single operation in the following manner:

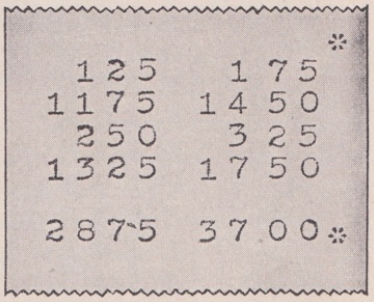


Figure 64
Cost and Selling Price

After the machine has been split in the fourth column from the left (Instructions for splitting the machine will be found on page 28), the example shown in Fig. 64 would be made as follows: Ascertain that the machine is clear and depress keys representing the left-hand figures (or cost) as if for ordinary addition. There are now five sectors remaining to the right for use in printing the selling price; and as it will be noted that the first item on the list consists of only three figures, it will be necessary to depress two ciphers after depressing the figures 1, 2, 5 representing the cost and before depressing the figures 1,7, 5 representing the selling price. After doing this, oper-

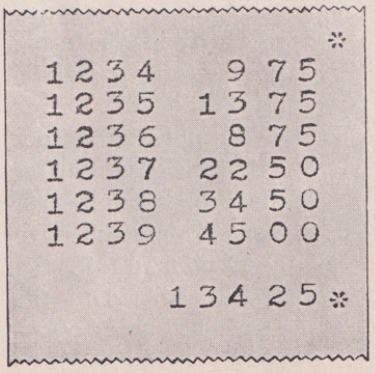


Figure 65
Numbers and Amounts

ate the lever and both items will be printed as shown in the example. List all other items in the same way, always bearing mind that enough ciphers must be added after the item representing the cost price to make, with the figures representing the selling price, five figures in all.

The machine when split for printing two totals at once can be used for numbers and amounts by using the four left-hand sectors to represent the numbers and the five sectors to the right to list amounts. Fig. 65 represents voucher numbers and amounts. Fig. 66 represents cotton bale numbers on the left, with the weights on the right. The sum of the numbers is prevented from printing by a special arrangement of the non-print mechanism with which certain of the Super Model machines may be provided if so specified before they leave the factory. In the absence of such special provision, printing of the total may be prevented by inserting the corner of a card in front of the paper.

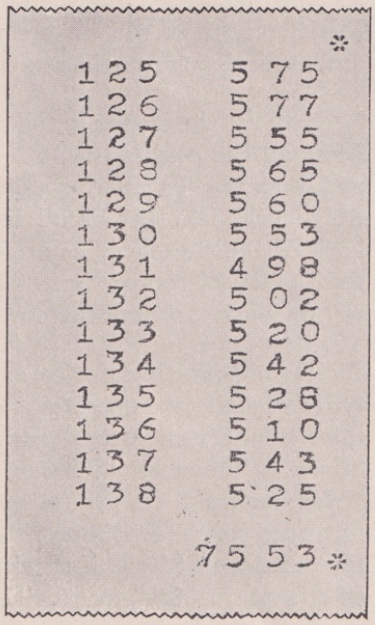


Figure 66
Bale Numbers and Weights

Many other practical uses may be found in different lines of business for the split device, which renders it possible to do a great variety of work of this general character.

Trial Balance

The Dalton Super Model greatly facilitates taking a trial balance, inasmuch as by its use both sides of the ledger may be taken at one time going through, thus saving much valuable time and avoiding the liability of making many errors.

In the customers' ledger of a mercantile establishment perhaps 95% to 98% of the accounts will represent indebtedness due to the merchant and the remainder will represent amounts due customers on account of discounts, allowances, returned goods, produce, etc. The sample trial balance shown in Fig. 67 represents some accounts taken from a ledger of this kind. The items undesignated represent the indebtedness of the various customers, while the amounts designated by "v" represent the amounts due to customers. The total of the upper column of figures in the sample trial balance represents the sum of the debit items only, the items representing credit balances not being added. In the lower column, however, are the designated or credit items, with their sum and following that the remainder after deducting the sum of the credit items from the sum of the debit items, thus leaving the net amount of the debits shown on the trial balance, all at a single time going through the ledger.

It goes without saying that the actual trial balance of the customers' ledger of even a small concern would contain many times the number of items shown in Fig. 67, but the comparatively few amounts given in the example will serve to illustrate the principle. It is recognized, also, that under certain conditions it might be found advisable to go through the ledger first listing only the debit balances and then go back and pick up the credits. Where the credit balances are few in number, however, it is usually a great advantage to be able to take all of the accounts clean as you go.

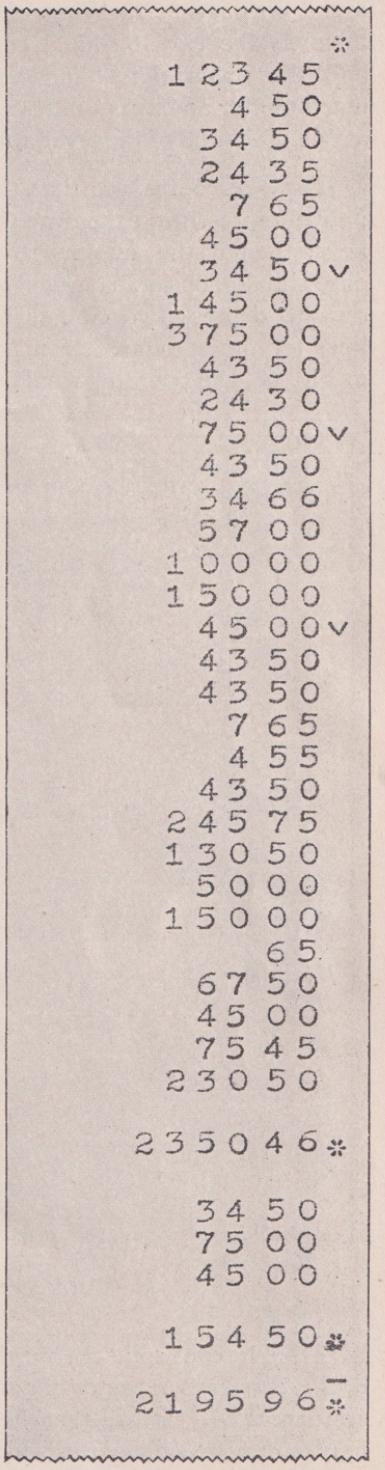


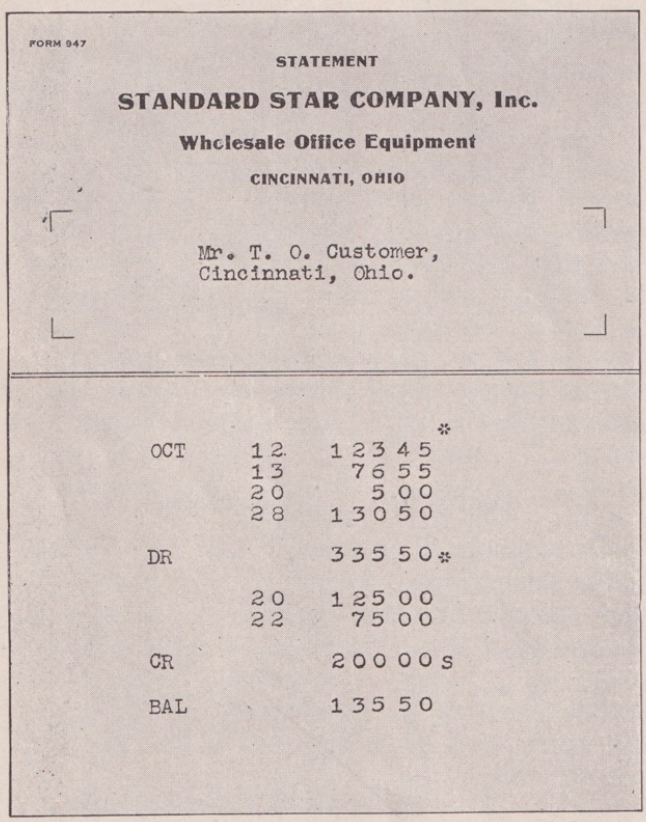
Figure 67
Trial Balance

Making Statements

A great many Dalton Super Models have found their way into the busy mercantile establishments for making monthly statements, and the machine is worth its entire purchase price for making statements alone if it could be used for no other purpose. For making statements, the machine is "split" in the second column from the left. (Instructions for splitting the machine will be

found on page 28.) When the machine is split in this manner, the two left-hand columns are used for dates and the seven right-hand columns (in a nine figure machine) for amounts; dates and amounts being printed at one operation of the lever and in the following manner:

First, of course, see that the machine is clear. The figures representing the date should be depressed on the keys, then if the amount to be printed opposite that date should consist, say, of five figures, it will be necessary to depress two ciphers before depressing the five keys for the amount. In making the statement shown in Fig. 68, the operator would proceed as follows:


FORM 947

STATEMENT

STANDARD STAR COMPANY, Inc.

Wholesale Office Equipment

CINCINNATI, OHIO

Mr. T. O. Customer,
Cincinnati, Ohio.

			*
OCT	12	12345	
	13	7655	
	20	500	
	28	13050	
DR		33550	*
	20	12500	
	22	7500	
CR		20000	S
BAL		13550	

Figure 68
Monthly Statement

After having split the machine and ascertained that it is clear, keys representing the date of the first item are depressed. It will then be noted that there are five figures opposite this date, which would leave two blank or unused spaces. That the figures will print in the proper numerical order, it is necessary, therefore, to strike two ciphers, after which strike the figures 1 2 3 4 5 and operate the lever. In the next item strike the figures 13 representing the date. Inasmuch as there are only four figures in this item, it is necessary to strike three ciphers before depressing the keys for the amount. In the third item strike keys for 20 representing the date. As there are only three figures in this item, it will be necessary to strike four ciphers before depressing the figures representing the amount. In this way list date and amount of the remaining item. All the debits having been listed, in taking a grand total, slip the corner of a piece of paper or card board in front of the paper to prevent printing the total of the dates, should this not be desired to show on the statement. (When specified before leaving the factory, certain of the Super Model machines will be provided with mechanism for automatically accomplishing this purpose.)

Now list the credits in the same manner as the debits. After all the credits have been listed, print a sub-total and then the balance as taken from the ledger, after which print another grand total either on the face or back of the statement as preferred. The second grand total must, of course, agree with the total of the debits as previously printed, thereby proving the work correct.

A word-printing device equipped with fifteen logotypes whereby the operator is enabled to print abbreviations for fifteen words such as "Debit," "Credit," "Cash," "Balance," "Forward," "Freight," "Drayage," "Merchandise," the names of the months, etc., can be furnished with each Super Model machine at an additional price of $50.00 if specified before machine leaves the factory. Ask for further particulars. Also, investigate the Dalton line of Special Ledger Posting and Statement Machines, which afford many additional features and advantages.

Verifying Invoices

The Super Model, even in small offices, has more than saved its purchase price in a single year merely in verifying and proving invoices, leaving entirely out of consideration its innumerable other services. It is unique in this character of work in that it furnishes a physical verification or proof to be attached to the invoice, thus showing that it has *actually been audited* and that some clerk has not merely glanced at the figures and perfunctorily attached a check mark.

Items on invoices may be proven separately by multiplying in each instance the number of items by the price and taking a grand total, after which it will be necessary to add these various totals that have been proven in order to get the total amount of the invoice itself.

Where it is necessary to know only that the total amount of the invoice is correct, it is better to multiply the numbers of items by the prices without taking a total after each multiplication, thus permitting the amount of all to accumulate in the machine to be printed as a grand total after the last multiplication.

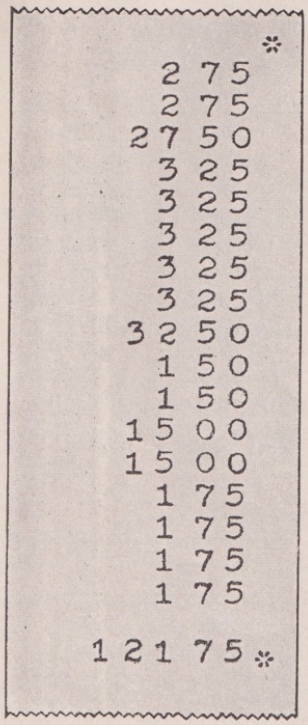


Figure 69
This is a verification of the invoice shown on this page. Such a slip should be pinned to each invoice before payment.

Fig. 69 shows a physical verification of the invoice which follows, and was done by making all the multiplications before taking the total:

12 prs. shoes at.	$2.75	$33.00
15 prs. shoes at.	3.25	48.75
22 prs. shoes at.	1.50	33.00
4 prs. shoes at.	1.75	7.00
Total		$121.75

In verifying invoices and carrying forward totals, as illustrated in this example, it is necessary to use care so that the decimals will accumulate in the machine in the proper numerical order. If, as a result of some of the multiplications, four decimals would appear in the product, it will be necessary to allow four decimal places in each and every item on the invoice. Thus, 3½ dozen at .12½ per dozen if multiplied on the machine would show a printed product of .4375, making four decimal places. If the item following this should be 4 dozen at .16 per dozen it will be necessary to add two ciphers to the .16 before multiplying by 4 in order that the product may contain four decimals and thereby list in the proper column for addition. Under "Predetermining the Decimal Point in Multiplication" on page 23, a convenient rule for this purpose is given.

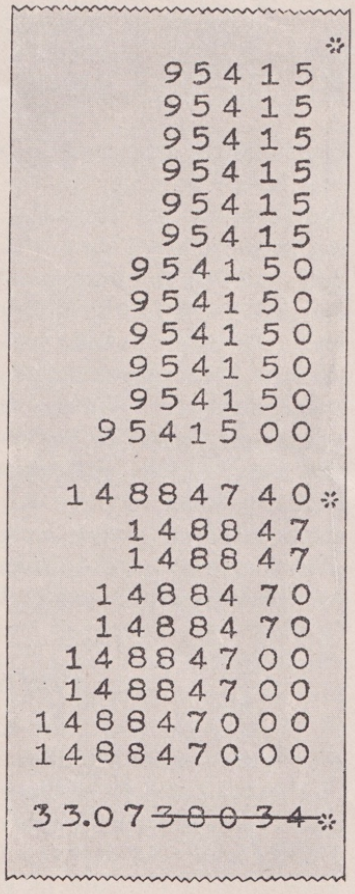


Figure 70
Interest — Example No. 1

Figuring Interest

Interest is the extended product of three factors—the principal, multiplied by the time, multiplied by the rate. Elaborate tables may be procured whereby the multiplications are avoided. It then becomes necessary, however, to turn through the pages of the tables and pick out the values required. When the principal is not a round amount, as many as half a dozen of these separate values must sometimes be located, copied and added, with opportunities for error at each step. The facility with which multiplication may be performed with a Dalton Super Model should relegate these voluminous interest tables to the waste basket in every office in the land. With only a few values representing interest on a dollar for a day at the rates required neatly written on a card and posted for convenient reference (Values for rates most frequently used would soon be learned so that it would not be necessary to refer to the card), computations of interest are made with greater speed and less fatigue on the Super Model than is possible with the most elaborate and costly interest tables ever produced. And, too, with each result there will be a little section of adding machine tape containing every figure in the computation, by means of which the work may be rechecked almost at a glance by the operator himself or anyone else.

Tables will be found on the next page showing at sight the interest on one dollar for one day at rates ranging by eighths from ⅛% to 11⅞%, computed on the basis of both 360 and 365 days to the year.

EXAMPLE No. 1: Find the interest on $954.15 for 156 days at 8%.

Multiply the principal by the number of days and take a grand total, which will be the number of dollars on interest for one day. Put the dollars back into the machine, omitting the cents, and multiply by the decimal representing the rate per cent, but omitting the last three figures as shown in accompanying tables. Then take another grand total, drawing a line through the five figures to the right. The remaining figures to the left will be the interest *expressed in cents*. Refer to Fig. 70.

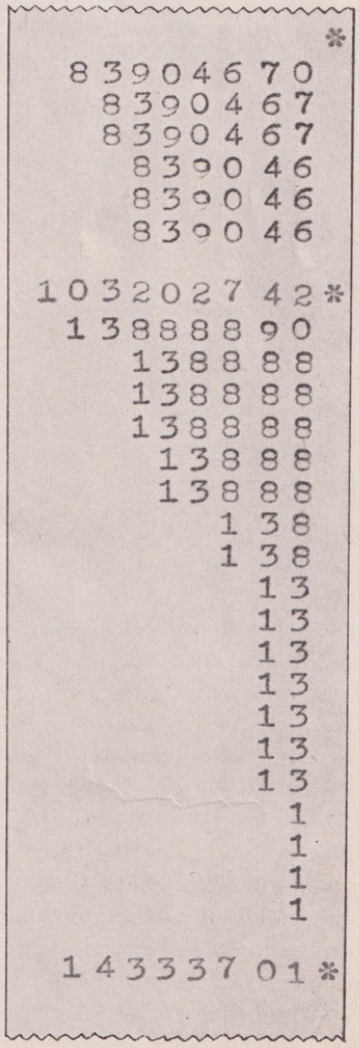


Figure 71
Interest — Example No. 2

360 DAYS TO YEAR—INTEREST ON $1.00 FOR ONE DAY

%		1/8	1/4	3/8	1/2	5/8	3/4	7/8
	.000	.000	.000	.000	.000	.000	.000	.000
		0034722	0069444	0104167	0138889	0173611	0208333	0243056
1	0277778	0312500	0347222	0381944	0416667	0451389	0486111	0520833
2	0555556	0590278	0625000	0659722	0694444	0729167	0763889	0798611
3	0833333	0868056	0902778	0937500	0972222	1006944	1041667	1076389
4	1111111	1145833	1180556	1215278	1250000	1284722	1319444	1354167
5	1388889	1423611	1458333	1493056	1527778	1562500	1597222	1631944
6	1666667	1701389	1736111	1770833	1805556	1840278	1875000	1909722
7	1944444	1979167	2013889	2048611	2083333	2118056	2152778	2187500
8	2222222	2256944	2291667	2326389	2361111	2395833	2430556	2465278
9	2500000	2534722	2569444	2604167	2638889	2673611	2708333	2743056
10	2777778	2812500	2847222	2881944	2916667	2951389	2986111	3020833
11	3055556	3090278	3125000	3159722	3194444	3229167	3263889	3298611

365 DAYS TO YEAR—INTEREST ON $1.00 FOR ONE DAY

%		1/8	1/4	3/8	1/2	5/8	3/4	7/8
	.000	.000	.000	.000	.000	.000	.000	.000
		0034247	0068493	0102740	0136986	0171233	0205479	0239726
1	0273973	0308219	0342466	0376712	0410959	0445205	0479452	0513699
2	0547945	0582192	0616438	0650685	0684932	0719178	0753425	0787671
3	0821918	0856164	0890411	0924658	0958904	0993151	1027397	1061644
4	1095890	1130137	1164384	1198630	1232877	1267123	1301370	1335617
5	1369863	1404110	1438356	1472603	1506849	1541096	1575343	1609589
6	1643836	1678082	1712329	1746575	1780822	1815069	1849315	1883562
7	1917808	1952055	1986301	2020548	2054795	2089041	2123288	2157534
8	2191781	2226027	2260274	2294521	2328767	2363014	2397260	2431507
9	2465753	2500000	2534247	2568493	2602740	2636986	2671233	2705479
10	2739726	2773973	2808219	2842466	2876712	2910959	2945205	2979452
11	3013699	3047945	3082192	3116438	3150685	3184931	3219178	3253425

The method used with Example No. 1 is adapted to interest computations where only comparatively small amounts are involved. For handling larger problems, a slightly different method is suggested.

EXAMPLE No. 2: Compute the interest on $83,904.67 for 123 days at 5%.

Multiply the principal by the days, using the method explained under "Multiplication from Left to Right" on page 23. Locating the decimal point in the product as directed, we have the equivalent of $10,320,274.20 on interest for one day. This is to be multiplied by the amount of the interest on one dollar for one day, which the 360-day table shows to be .0001388889. It can make no difference in the result which factor we use as the multiplicand. We observe, however, that the figures representing total amount on interest for one day are smaller than those in the other factor and, to save machine operations, we choose the factor with larger figures as the multiplicand. The method for predetermining the decimal point as explained under "Predetermining Decimal Point in Multiplication" on page 23 should be studied and followed. It is suggested that four places be provided for decimals in the product, which would mean that two places would be retained for cents and the other two discarded from the result. This will insure accuracy to the nearest cent. As we are providing for four decimal places in the product, according to the rule we start with 3 (one less than four) and add 8, being the number of figures to the left of the decimal point in the multiplier. This means that to bring our result to four decimal places a total of eleven decimal places must be used in the multiplicand. As three of these are ciphers, there would remain but eight significant figures of the multiplicand to be struck on the keys. After striking the seven digits 1388889, strike a cipher in order to make the total number of digits required in the set-up. Completing the multiplication, we find the interest to be $1,433.37. Study each step as illustrated in Fig. 71.

Prorating

Work of this character, so frequently left to auditors, accountants and actuaries as something too difficult and complicated for ordinary business people, is really quite easy and simple when handled according to the Dalton way. In fact, to the operator with ordinary knowledge of the rules of arithmetic and having access to a Dalton Super Model machine of not less than, say,

9 figures capacity, the operation of prorating is converted into simple mechanical routine, requiring only ordinary care to see that operations follow in proper order and no step is omitted.

PROBLEM: Let us suppose that the sales of the different departments of a concern over a given period of time are as follows:

Department A —	$13,417.24
Department B —	36,440.18
Department C —	11,623.21
Department D —	712.20
Department E —	27,334.23
Department F —	7,213.40

and that during the same period there was an overhead expense or "burden" amounting to $19,573.01: Required to find the percentage of the total sales represented by the sales of each department and the amount of the burden for each, based on the relative volume of its sales.

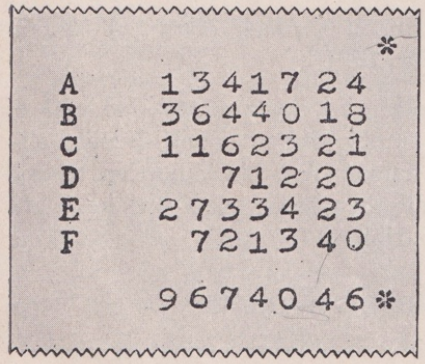


Figure 72
Sales by Departments

After clearing the machine, list the sales by departments to find the total sales, which a grand total discloses to be $96,740.46. See Fig. 72.

By reference to the Dalton Book of Reciprocals and disregarding the cents, we find that .00001033699 is the reciprocal for the amount of the total sales. After determining the location of the decimal point as explained on page 23 under "Predetermining Decimal Point in Multiplication," set up the reciprocal in the machine and multiply in turn by the sales of each department, using the method explained under "Multiplication from Left to Right" on page 23, taking a grand total after each multiplication. After fixing the decimal point in the various totals according to rule, they will constitute the percentages to total sales of the sales of their respective departments. Proof that the work is correct is made by listing these percentages and securing a total of 100. See Fig. 73.

In the accompanying illustration of this problem the list of sales by departments is shown but the actual multiplications of the reciprocal of total sales by sales of the departments have been omitted as unnecessary. The percentages resulting from these multiplications, (Fig. 73) however, are as follows:

	% of burden
Department A —	13.87
Department B —	37.67
Department C —	12.01
Department D —	.74
Department E —	28.26
Department F —	7.45
Total.....	100.00

The burden of $19,573.01 is now to be prorated among the six departments in proportion to their respective sales.

After determining upon the location of the decimal point to be used for the series of multiplications as explained on page 23 and seeing that the machine is clear, set up the amount of the burden to be distributed, bringing it to the proper numerical position in the machine. Then multiply by the percentage of each department, taking a grand total after each multiplication, after which properly indicate the decimal point in each total. List these totals, which will represent the proper share of the burden for each department, and agree in total with total amount of burden. In order to secure an exact balance, it may sometimes be necessary to change the figure in units of cents place to make up for dropping a succeeding figure greater than 5.

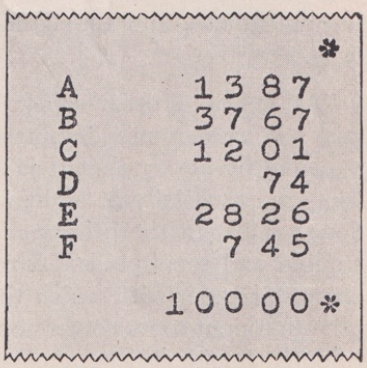


Figure 73
Percentages by Departments

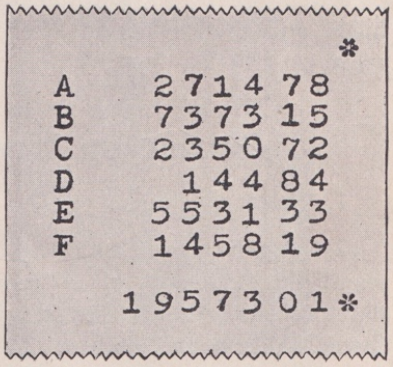


Figure 74
Burden by Departments

It has been thought unnecessary to illustrate these multiplications, their results, however, being as follows:

	Burden
Department A —	$ 2,714.78
Department B —	7,373.15
Department C —	2,350.72
Department D —	144.84
Department E —	5,531.33
Department F —	1,458.19
Total Burden	$19,573.01

Study The Instructions

Insist, first of all, upon everyone who is to operate the machine familiarizing himself with its general plan of construction and mode of operation as explained in these instructions. Your Dalton Super Model is built for service and hard work, and so long as the uses are legitimate and proper no harm can come. Long hours or overtime make no difference to the machine. Injury results only from abuse, and it matters not at all to the object of the abuse whether it be intentional or the result of mere ignorance. The operator who has studied the instructions will know how to draw the line between use and abuse, and that is all that should be required or expected.

Aside from gross misoperation, the things most to be guarded against are dampness and dirt. Protect the machine by seeing that it is kept covered when not in use—and especially at night while janitor work is being done. Dust in the bearings is a most fruitful cause of trouble and repair bills. Lint from cheap adding machine roll-paper with which the market is flooded is another frequent source of trouble. Cheap cut-edge inking ribbons should also be avoided.

In extremely cold weather when the office is not kept heated at night the machine will operate sluggishly in the morning until it has had a chance to get warmed up. This is occasioned by the oil in the governor or "dash-pot" becoming congealed. There is no need to be concerned, however, as the machine will resume its usual quick and snappy action after it has been allowed to warm up a little.

Putting on New Ribbon

1. Clear machine.

2. Again push in total key and pull handle forward about three-quarters of its movement and leave it in that position. This raises the ribbon guides and makes them readily accessible.

3. Release the ribbon spools by pulling out the retaining clip on outside of each ribbon cup and then lift out the spools. Notice carefully so you can tell which is the top of the spool.

4. Remove the old ribbon from the ribbon guides, first carefully noting exact manner in which it is threaded through the prongs.

5. Disengage old ribbon from both spools and throw it away.

6. In the hub of ribbon spool there are two slots, one straight and the other with an enlarged portion. Insert the metal clip on the free end of new ribbon into the *straight* slot in hub, being careful that the black portion of ribbon is *toward the top of spool.* A small pair of pliers will be convenient in handling the clip, although it may be dropped in by holding ribbon a couple of inches from the end. After clip has entered slot, wind the ribbon around the spool two or three times

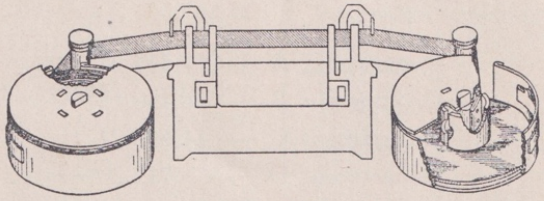


Figure 75

and then replace the spool on its shaft, pulling out the little retaining clip on outside of ribbon cup in so doing. See that shaft enters the half-round hole in top end of ribbon spool. Holding the new ribbon lightly by the spool so that it will turn freely, wind it onto the spool on the machine.

7. Thread new ribbon through prongs of ribbon guides as shown in Fig. 75.

8. Insert the metal clip attached to free end of ribbon into hub of empty ribbon spool, placing slip through the straight narrow slot, black portion toward the top as before, and then place spool on the shaft, adjusting slack in the ribbon.

A Dozen Don'ts

1. Don't leave the machine uncovered at night.

2. Don't try to depress two numeral keys at the same time.

3. Don't operate lever with one hand and numeral keys with the other.

4. Don't touch sub-total key in operating total key for taking grand total.

5. Don't try to print a total or sub-total without making a blank or spacing stroke.

6. Don't try to list and add numbers with multiplication key or non-print key locked down.

7. Don't interfere with the type carrying sectors when they move up to position the type for printing.

8. Don't try to list a column of figures with the line space control lever in the non-space adjustment.

9. Don't try to operate the machine (either by the handle or motor bar) while a numeral key is depressed.

10. Don't operate machine in a "split" adjustment on regular work. See "Splitting the Machine" on page 28.

11. Don't leave item counter control lever turned back except when use is being made of the item counter mechanism.

12. Don't try to depress any key (with the single exception of the multiplication key) after the operating handle has started forward.

Dalton Service

The business and reputation of the Dalton Company have been built up around the theory and belief that a satisfied customer is the best asset a company ever had or ever can have. The money that has been expended, first in building satisfaction and service into our product, and later in seeing that after-purchase service exceeds rather than falls short of expectation, we are convinced has been far more wisely and effectively spent—considered merely as an advertising measure for the creation of good will—than if it had been devoted to the purchase of space in the highest class advertising mediums in the land. The company certainly feels a very real and substantial interest in the character of service which you receive from your Dalton equipment, its concern in this regard at least approximating, if it do not equal, your own. To the extent, therefore, of this common interest in the machine's performance we regard ourselves as standing in the relation of a partner to every owner of a Dalton machine; and as one partner speaking to another, we offer the following suggestions.

(*a*) Ascertain from the salesman or from the home office the address of the Dalton service station nearest you and preserve it for future reference.

(*b*) In case of accident or misadjustment promptly notify the service station, furnishing as much information as you are able as to the extent and nature of the trouble. If the address of the service station be misplaced send the notice direct to the company.

(*c*) Under no circumstances entrust the adjustment or repair of your machine to a local mechanic or permit him to touch it for any purpose whatever. It is no reflection upon his mechanical attainments that he should not be able to adjust a Dalton machine. The mechanic does not live who can do so properly unless he has had previous training and instruction and knows first what the proper adjustments are and second, how to make them. Our mechanical experts give you the benefit of a thorough training and a ripe experience.

Dalton Quality Ribbons

Cheap ribbons with which the markets are flooded are sometimes tempting on account of their low first cost, but we have by actual test found them in every instance more expensive to the user from a standpoint of ribbon cost alone than our own special ribbons, to say nothing of the adding machine troubles that are traceable directly to the use of ribbons not suited to our printing and ribbon control mechanisms. We have, in fact, known of expensive repairs and adjustments to the machine having been made necessary by the use of these worthless, gummy, uneven ribbons, which are usually of incorrect length and mounted on improper spools.

Figure 76

Few users of adding machine ribbons, of course, could take the trouble or afford the expense to subject the ribbons they purchase to laboratory tests sufficiently thorough to be sure they are of the required standard. Only the manufacturer handling a great volume of business can have an organization large enough to include specialists in these things. The Dalton name on the ribbon, however, carries the same assurance of merit as on the name plate of the machine itself.

Our ribbon coupon plan gives you the advantage of convenience and quantity price and further insures your ribbons always being from fresh stock just as they are required for use. Ask for details of the ribbon coupon plan the next time the Dalton man comes around.

Dalton Roll-Paper

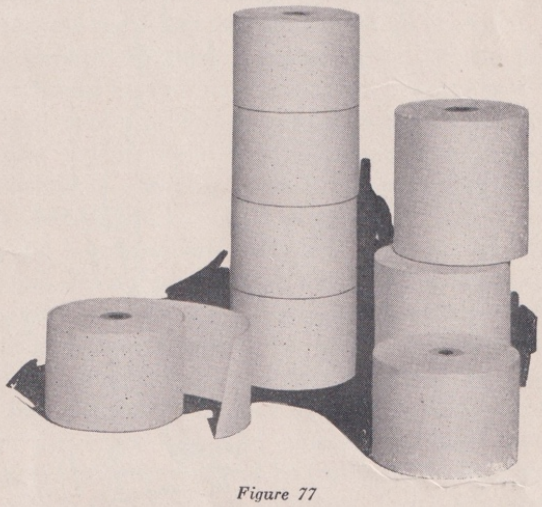


Figure 77

Special quality roll-paper manufactured to meet the requirements of Dalton machines is always available for prompt shipment whether your requirement be a single roll, a carton of 25 or 50 rolls or a thousand cartons. Our large purchases of paper give us an advantage in securing close prices. Standard widths, 2-5/16 and 3-15/32 inches.

DALTON SERVICE STATIONS

Dalton Service Stations are conveniently located throughout the United States and Canada. In event of accident or misadjustment expert assistance is always near at hand.

Touch Operation

The student taking up the study of Touch Operation may not see the necessity for some of the directions and requirements that have been laid down. Bear in mind, however, that these instructions represent the best thought and judgment of eminent educators who have had long and extensive experience in the actual teaching of the subject; and that the methods followed in these lessons have been found to afford the *easiest, simplest and quickest* route to the mastery of Touch Operation of the Adding Machine.

Before starting on the lessons study carefully the instructions for operating the machine appearing on pages 8 to 17. Be sure that you fully understand the use of the machine at least for listing and adding.

Position of the Operator

Either the sitting or the standing position may be assumed. The former, perhaps, will be preferred by most operators. Place the machine a little to the right, allowing the left forearm, if desired, to rest lightly on the leaf of the stand.

Position of the Hand

Place the fingers of the right hand on the lower row of keys so that the thumb rests on the 1-key, the index finger on the 3-key and the middle, ring and little fingers on the 0-, 6- and 8-keys, respectively. This is called "Position." The hand should be brought back to "Position" quickly after each lever stroke. This is easily accomplished at the start without looking at the keyboard, as the multiplication and subtraction keys serve as convenient guides. After a little practice it will be found that the hand returns to "Position" instinctively without the necessity of any guide whatever. *Be honest with yourself and do not look at your hand or the keyboard while practicing.*

The Lever Stroke

Pull the lever quickly, releasing it as soon as the stroke is completed and permitting it to return of its own accord, immediately bringing the hand to "Position" agian preparatory to depressing the keys for the next item. Practice operating the lever and returning the hand to "Position" until able to do it easily and surely. Keep the eyes away from the keyboard.

If the machine be equipped with the electric drive, instead of operating the lever, depress the motor bar.

Operate Slowly

Go slowly at first. Speed comes in due time with practice. This is most important, for speed is worth nothing without accuracy. *It is also most important that the proper fingering be used at all times.*

Finger Exercises

Just before beginning practice on Lesson I practice the following finger exercises for about ten minutes.

Bring hand to "Position" as already explained and depress the keys in succession as follows: 1-Key with thumb, 3-Key with index finger, 0-Key with middle finger, 6-Key with ring finger, 8-Key with little finger. Operate the lever. Now write 13068 in this way continuously for five minutes.

Reverse this exercise, using the same fingering and write 86031 continuously for five minutes. These exercises should, of course, be performed without looking at the keyboard.

Until the positions of the different keys become thoroughly fixed in the mind, it may prove helpful to place the book on the shelf of the stand and refer to the chart shown at the top of the next page while the fingers locate and operate the keys for the amounts shown in Lessons I and II.

Practice is Everything

You will, of course, quickly learn the location of the keys so that you can close your eyes and picture the keyboard just as it actually is. That, however, is not enough. It is going to be necessary to *teach the keyboard to your fingers.* They must be trained so that the instant the eye sees a 3 the index finger will subconsciously find and operate the 3-key; so that when the eye sees a 7 that very instant the ring finger will locate and depress the 7-key and so on with all the keys. Mere study cannot do this. Concentration of the mind on the keyboard can no more teach the fingers how to find the keys than study of a baseball score board can train a player to hit home runs. This training can be accomplished in one way—and in one way *only*—and that is BY PRACTICE. This practice at first will necessarily be laborious and tedious; and the faint-hearted may feel discouragement at what seems unsatisfactory progress. Just a little patience here to keep faithfully at the lesson exercises, if for only a few minutes each day, will soon bring its reward. From the time you first become aware of your ability to place the proper finger on each key and operate without conscious thought, improvement will be rapid; and all at once you will realize that you are an *actual Touch Operator.* All that will be then be required is to use Touch Operation on your daily work, gradually increasing your speed as you find you can. Mere speed, however, must never be sought at the expense of accuracy; and as here used, the term "accuracy" applies as well to *fingering* as to the depression of the correct keys. From the standpoint of Touch Operation, an error in fingering is as much to be guarded against as actually striking a wrong key.

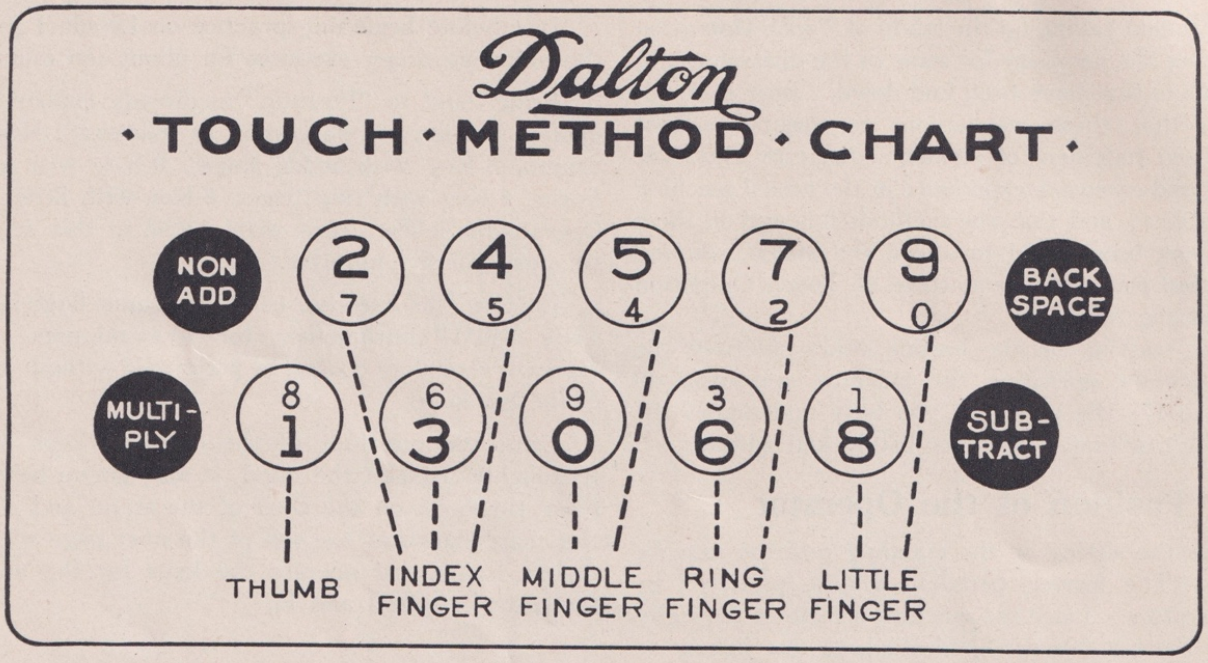


Figure 78
Chart for Fingering

Lesson I

This lesson consists of exercises employing the lower row of keys ONLY. All of the fingers of the right hand are brought into play. Run each example until at least THREE CORRECT ANSWERS are secured IN SUCCESSION.

*	*	*	*	*	*
13	36	81	13	81	11
30	80	36	10	83	33
60	33	80	16	80	66
80	61	16	18	86	88
86	81	81	31	61	10
81	68	61	30	63	30
38	18	31	36	60	60
36	86	38	38	68	80
81	83	68	61	31	81
30	30	18	63	33	61
16	61	61	60	30	31
86	68	63	68	36	13
68	38	68	81	38	10
61	83	60	83	11	16
16	16	81	86	13	18
7 82*	8 42*	8 43*	6 94*	7 74*	6 08*

Be Honest with Yourself — Don't Look at The Keys

Lesson II

Review Lesson I briefly. In the present lesson, in addition to the lower row of keys, the 2- and 4-keys are introduced. Both of these new keys are depressed with the index finger. Run each example until at least THREE CORRECT ANSWERS are secured IN SUCCESSION.

Be particular with your fingering.

*	*	*
12	26	42
21	28	61
13	48	14
31	62	14
24	64	41
40	21	16
20	46	42
23	61	28
22	42	24
12	82	16
20	24	68
32	61	12
41	14	46
82	41	26
26	16	84
4 19*	6 36*	5 34*

*	*	*
12	41	11
14	43	22
32	40	33
34	46	44
62	48	66
64	14	88
82	24	10
84	34	20
21	64	30
23	84	40
26	21	60
28	23	80
41	24	24
43	20	42
46	26	22
6 12*	5 52*	5 92*

Lesson III

Review Lessons I and II briefly. In this lesson the remaining keys (5, 7 and 9) are introduced. The 5-key is depressed with the middle finger, the 7-key with the ring finger and the 9-key with the little finger. Each example should be run until at least THREE CONSECUTIVE CORRECT ANSWERS ARE SECURED.

*	*	*	*
51	28	71	67
45	51	37	42
25	25	25	70
35	54	17	87
51	20	75	67
85	65	57	65
82	83	73	78
58	54	75	27
55	12	74	87
42	50	72	72
14	25	37	76
20	68	71	47
50	38	47	37
56	50	67	17
14	52	76	85
6 83*	6 75*	8 74*	9 24*

*	*	*	*
92	94	11	61
93	93	92	81
19	59	10	22
97	49	41	23
49	39	31	14
92	89	26	21
94	92	20	23
69	94	12	69
98	97	18	57
89	69	42	83
79	49	77	75
94	29	91	33
98	91	31	83
89	47	10	19
49	14	37	66
12 01*	10 05*	5 49*	7 30*

Accuracy First, Then Speed — Have Patience

Lesson IV

Run all of the lists given in the first three lessons ONCE EACH. Each of the new examples should be run until at least THREE CONSECUTIVE CORRECT ANSWERS ARE SECURED. And don't forget that improper fingering counts as an error the same as striking a wrong key.

*	*	*
1 30	2 13	1 25
1 08	2 04	5 00
3 16	2 42	2 51
6 16	2 41	6 85
8 68	2 06	3 82
3 61	2 84	5 06
8 36	4 61	5 20
6 81	8 24	2 50
3 08	6 14	2 56
1 86	4 16	5 14
8 00	8 24	5 06
1 30	4 61	5 28
3 06	2 42	3 54
1 00	4 24	5 20
6 38	2 04	4 65
63 84*	58 60*	63 62*

*	*	*
7 25	9 32	4 65
3 75	9 67	3 33
6 75	8 49	1 25
2 57	1 92	6 78
7 50	9 18	3 11
3 71	8 09	5 25
3 67	8 33	1 50
4 25	9 48	6 67
4 87	7 78	4 32
3 67	4 89	2 25
6 50	7 49	1 50
8 25	2 42	5 56
4 78	9 37	7 67
8 27	6 94	2 25
3 71	9 32	3 11
79 50*	112 69*	59 20*

Lesson V

Review Lesson IV briefly, running each of the lists once only. As will be seen, larger amounts are now being introduced. Each list should be run until THREE CONSECUTIVE CORRECT ANSWERS are secured. After mastering this lesson, the operator should be able to employ Touch Operation in daily work.

*	*	*
33 45	73 23	198 67
47 23	133 75	567 89
67 00	66 43	34 42
213 45	635 75	100 90
413 75	133 34	67 78
63 55	78 87	222 11
498 15	226 88	13 12
188 78	546 78	76 89
10 00	12 50	235 21
78 64	887 67	98 23
45 78	67 85	178 80
45 30	78 21	677 87
100 67	22 98	456 22
443 45	133 75	246 79
354 64	375 45	220 00
2603 84*	3473 44*	3394 90*

*	*	*
11 37	616 00	354 00
92 25	81 33	573 68
100 25	22 25	21 33
4 17	230 01	100 87
313 75	14 56	32 40
262 85	21 47	167 68
319 71	23 80	66 00
20 03	6 97	341 65
12 37	69 47	118 44
181 85	579 20	500 00
424 50	833 50	100 45
774 25	750 00	345 65
912 61	333 33	167 68
31 48	83 75	122 00
100 00	198 67	65 98
37 50	666 67	127 43
83 75	19 28	60 45
250 33	119 28	22 65
21 67	723 41	100 00
3954 69*	5392 95*	3388 34*

Use Care in Fingering — Don't Look At The Keys

DALTON PRIZE SPEED LIST

The student is now ready to begin practice on the following list, known as the Dalton Examination Test List. A Dalton Diploma of proficiency in "TOUCH METHOD" will be awarded to the student who furnishes the Company with a certificate signed by the student and two witnesses showing that list No. 1 was correctly run by the student in presence of the witnesses in 80 seconds or less. If the time be one minute or less the student becomes eligible for membership in the Delta Alpha Mu Society, and the insignia, a gold pin, is presented with the Diploma.

The "DELTA ALPHA MU" Society is one of the fastest growing organizations in the world, yet it is limited to those who have become skillful in the use of Touch Method on the Dalton machine. There are no initiation fees and no annual dues or assessments, except a commendatory word occasionally to your friends who may be considering the purchase of an adding or calculating machine, Cash Register, or Bookkeeping machine.

"Inner Circle" of Delta Alpha Mu

The cry of the business world is "MORE SPEED" and with the hope of contributing our bit to the world's progress in the direction of speed and efficiency in handling figures, an "INNER CIRCLE" of the DELTA ALPHA MU Society has been created, composed of the fastest adding machine operators in the world.

Entrance to this select division of the DELTA ALPHA MU is gained by listing and adding, correctly, on a hand driven Dalton, the Prize Speed List No. 2 by Touch Method in four minutes or less.

The insignia of this exclusive circle of the DELTA ALPHA MU is a beautiful and refined gold pin, studded with pearls. In view of the value of the pin, it is necessary that the time made on the List be subscribed before a Notary.

LIST No. 1	LIST No. 2				
1328 75	26 37	13 23	6 50	32 52	47 52
48 50	58 67	1 80	7 99	4 52	9 09
11 50	112 20	30 54	1 80	982 64	69 58
9 25	26 48	14 98	77 00	55 52	104 83
12 00	148 39	5 59	6 37	32 28	54 95
219 52	61 67	107 36	4 35	72 77	18 65
289 29	179 10	9 88	35 70	9 72	75
66 15	39 35	1 25	27 58	49 77	36
2 75	94 11	5 71	29 75	26 13	13 78
89 74	5 33	48 49	168 76	99 30	21 55
77 00	42 62	4 24	2 49	85 29	20 00
400 00	76	39 51	87	65 40	23 89
383 38	52	58 67	19 14	23 19	44 43
266 53	20 61	111 04	63 22	47 52	28 16
17 50	15 33	9 37	45 20	3 30	7 28
500 00	89	40 70	49 76	1 62	13 64
23 79	17 31	56 40	24 00	1 00	45
39 20	60 78	45 15	17 56	46 26	49 63
17 75	55 36	45 94	72 00	38 52	13 22
69 45	13 78	136 70	7 92	12 45	2 55
5 00	25 70	58 50	36 26	71 17	15 00
255 35	4 25	74 94	81 26	37	23 21
2 50	6 61	792 81	51 64	27 70	6 08
14 50	9 09	55 52	23 30	8 93	168 77
10 26	69 58	32 28	37 33	37 43	4 95
68 30	4 83	19 14	29 75	13 14	42
6	38 41	63 22	170 91	19 32	24 17
740 27	9 44	45 15	7 98	6 57	41 64
69 91	37 21	8 50	31 03	21 96	65 40
12 00	22 00	1 88	6 17	11 76	26 13
90 52	103 54	1 00	10 00	63 55	96
12 50	136 70	37	6 42	8 50	22
1 00	58 50	6 72	63 43	51 64	75 55
9 00	71 66	58 45	27 20	11 54	8 65
298 79	21 62	8 40	18 18	20 00	17 75
80 64	3 45	1 88	4 04	27 40	45 15
100 00	37 11	12 80	18 10	49 00	43 62
50	1 63	21 16	12 60	24 00	200 00
1 00	4 25	32 44	15 12	17 56	37 60
	126 63	5 19	1 88	81 75	101 75
		3 30	21 30	3 49	37 21

5644 15*

8958 94*

Explanation of the Tables

For convenience, all commodities weighing the same per bushel are grouped under one head. While they are very elastic and cover practically every known commodity that is sold by the bushel, these tables are not complete working tables. They do, however, lay the foundation for such tables which by their use may be quickly prepared.

The grain buyer, for example, may take them and prepare complete working tables covering the minimum and maximum prices for a season of grains in which he deals. For illustration, let us suppose that wheat in a season ranges in price between $1.40 and $1.60 per bushel: The grain buyer refers to the proper table and notes that the price per pound of wheat at $1.00 is the decimal .0166667; so he lists this on his Dalton machine, *adding two ciphers*. To this he then adds the price at 40 cents, likewise affixing two ciphers, and takes a sub-total, which is the price per pound of wheat at $1.40 per bushel. As the price of wheat varies by eighths, it is desirable to have the complete working table express all prices by eighths. By further reference to the table, he finds the value per pound of wheat at 1/8 of one cent per bushel to be the decimal .000020833. He lists the 20833 on his Dalton immediately under the sub-total just printed and takes another sub-total, which is the price per pound at $1.40 1/8 per bushel. He then lists again the 20833 as before, taking another sub-total, which is the price at $1.40 1/4 per bushel; and he continues in this way until he reaches $1.60 or the maximum price for the season. These amounts may then be copied from the strip of adding machine paper to a sheet or cardboard and posted for easy reference.

Some prefer to reduce the odd pounds to decimals of a bushel, and for their benefit we give the tables of decimal equivalents. To use these tables, affix the decimal of the odd pounds to the number of bushels and multiply by the price per bushel. Use the other decimal equivalent tables in the same way.

Value Per Pound at Prices Per Bushel From 1/8 Cent to $10.00

Price Per Bushel Expressed in Cents	Corn in Husk 72	Corn in Ear 70	Wheat, Etc. 60	Onions 57	Shelled Corn Etc. 56
1/8	.0000 17361	.0000 17857	.0000 20833	.0000 21930	.0000 22321
1/4	.0000 347	.0000 357	.0000 417	.0000 439	.0000 446
3/8	.0000 521	.0000 536	.0000 625	.0000 658	.0000 670
1/2	.0000 694	.0000 714	.0000 833	.0000 877	.0000 893
5/8	.0000 868	.0000 893	.0001 042	.0001 096	.0001 116
3/4	.0001 042	.0001 071	.0001 250	.0001 316	.0001 339
7/8	.0001 215	.0001 250	.0001 458	.0001 535	.0001 562
1	.0001 389	.0001 429	.0001 667	.0001 754	.0001 786
2	.0002 778	.0002 857	.0003 333	.0003 509	.0003 571
3	.0004 167	.0004 286	.0005 000	.0005 263	.0005 357
4	.0005 556	.0005 714	.0006 667	.0007 018	.0007 143
5	.0006 944	.0007 143	.0008 333	.0008 772	.0008 929
6	.0008 333	.0008 571	.0010 000	.0010 526	.0010 714
7	.0009 722	.0010 000	.0011 667	.0012 281	.0012 500
8	.0011 111	.0011 429	.0013 333	.0014 035	.0014 286
9	.0012 500	.0012 857	.0015 000	.0015 789	.0016 071
10	.0013 889	.0014 286	.0016 667	.0017 544	.0017 857
20	.0027 778	.0028 571	.0033 333	.0035 088	.0035 714
30	.0041 667	.0042 857	.0050 000	.0052 632	.0053 571
40	.0055 556	.0057 143	.0066 667	.0070 175	.0071 429
50	.0069 444	.0071 429	.0083.333	.0087 719	.0089 286
60	.0083 333	.0085 714	.0100 000	.0105 263	.0107 143
70	.0097 222	.0100 000	.0116 667	.0122 807	.0125 000
80	.0111 111	.0114 286	.0133 333	.0140 351	.0142 857
90	.0125 000	.0128 571	.0150 000	.0157 895	.0160 714
100	.0138 889	.0142 857	.0166 667	.0175 439	.0178 571
200	.0277 778	.0285 714	.0333 333	.0350 877	.0357 143
300	.0416 667	.0428 571	.0500 000	.0526 316	.0535 714
400	.0555 556	.0571 429	.0666 667	.0701 754	.0714 286
500	.0694 444	.0714 286	.0833 333	.0877 193	.0892 857
600	.0833 333	.0857 143	.1000 000	.1052 632	.1071 429
700	.0972 222	.1000 000	.1166 667	.1228 070	.1250 000
800	.1111 111	.1142 857	.1333 333	.1403 509	.1428 571
900	.1250 000	.1285 714	.1500 000	.1578 947	.1607 143
1000	.1388 889	.1428 571	.1666 667	.1754 386	.1785 714

NOTE: Legal weight of commodities per bushel: Corn in husk, 72 lbs.; Corn in ear, 70 lbs.; Wheat, Beans, Peas, Clover Seed, Irish Potatoes, 60 lbs.; Rye, Shelled Corn, Flax Seed, Sweet Potatoes, Green Peas and Green Beans Unshelled, 56 lbs.; Onions, 57 lbs.

Value Per Pound at Prices Per Bushel From 1/8 Cent to $10.00

Price Per Bushel Expressed in Cents	Buckwheat, Etc. 52	Corn Meal, Etc. 50	Barley, Etc. 48	Castor Beans, Etc. 46	Timothy Seed, Etc. 45
1/8	.0000 24038	.0000 250	.0000 26042	.0000 27174	.0000 27778
1/4	.0000 481	.0000 500	.0000 521	.0000 543	.0000 556
3/8	.0000 721	.0000 750	.0000 781	.0000 815	.0000 833
1/2	.0000 962	.0001 000	.0001 042	.0001 087	.0001 111
5/8	.0001 202	.0001 250	.0001 302	.0001 359	.0001 389
3/4	.0001 442	.0001 500	.0001 562	.0001 630	.0001 667
7/8	.0001 683	.0001 750	.0001 823	.0001 902	.0001 944
1	.0001 923	.0002 000	.0002 083	.0002 174	.0002 222
2	.0003 846	.0004 000	.0004 167	.0004 348	.0004 444
3	.0005 769	.0006 000	.0006 250	.0006 522	.0006 667
4	.0007 692	.0008 000	.0008 333	.0008 696	.0008 889
5	.0009 615	.0010 000	.0010 417	.0010 870	.0011 111
6	.0011 538	.0012 000	.0012 500	.0013 043	.0013 333
7	.0013 462	.0014 000	.0014 583	.0015 217	.0015 556
8	.0015 385	.0016 000	.0016 667	.0017 391	.0017 778
9	.0017 308	.0018 000	.0018 750	.0019 565	.0020 000
10	.0019 231	.0020 000	.0020 833	.0021 739	.0022 222
20	.0038 462	.0040 000	.0041 667	.0043 478	.0044 444
30	.0057 692	.0060 000	.0062 500	.0065 217	.0066 667
40	.0076 923	.0080 000	.0083 333	.0086 957	.0088 889
50	.0096 154	.0100 000	.0104 167	.0108 696	.0111 111
60	.0115 385	.0120 000	.0125 000	.0130 435	.0133 333
70	.0134 615	.0140 000	.0145 833	.0152 174	.0155 556
80	.0153 846	.0160 000	.0166 667	.0173 913	.0177 778
90	.0173 077	.0180 000	.0187 500	.0195 652	.0200 000
100	.0192 308	.0200 000	.0208 333	.0217 391	.0222 222
200	.0384 615	.0400 000	.0416 667	.0434 783	.0444 444
300	.0576 923	.0600 000	.0625 000	.0652 174	.0666 667
400	.0769 231	.0800 000	.0833 333	.0869 565	.0888 889
500	.0961 538	.1000 000	.1041 667	.1086 956	.1111 111
600	.1153 846	.1200 000	.1250 000	.1304 348	.1333 333
700	.1346 154	.1400 000	.1458 333	.1521 739	.1555 556
800	.1538 462	.1600 000	.1666 667	.1739 130	.1777 778
900	.1730 769	.1800 000	.1875 000	.1956 522	.2000 000
1000	.1923 077	.2000 000	.2083 333	.2173 913	.2222 222

NOTE: Legal weight of commodities per bushel: Buckwheat, 52 lbs.; Corn Meal, Millet, Carrots, Rutabagas, Salt, 50 lbs.; Barley, Apples, Peaches, Pears, Cucumbers, Hungarian Grass, 48 lbs. Castor Beans, 46 lbs.; Timothy, Tomatoes, 45 lbs.

Decimal Equivalents—Pounds of a Long Ton

Pounds		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
0	.000	.045	.089	.134	.179	.223	.268	.312	.357	.402	.446	.491	.536	.580	.625	.670	.714	.759	.804	.848	.893	.937	.982
5	.002	.047	.092	.136	.181	.225	.270	.315	.359	.404	.449	.493	.538	.583	.627	.672	.717	.761	.806	.850	.895	.940	.984
10	.004	.049	.094	.138	.183	.228	.272	.317	.362	.406	.451	.496	.540	.585	.629	.674	.719	.763	.808	.853	.897	.942	.987
15	.007	.051	.096	.141	.185	.230	.275	.319	.364	.408	.453	.498	.542	.587	.632	.676	.721	.766	.810	.855	.900	.944	.989
20	.009	.054	.098	.143	.187	.232	.277	.321	.366	.411	.455	.500	.545	.589	.634	.679	.723	.768	.812	.857	.902	.946	.991
25	.011	.056	.100	.145	.190	.234	.279	.324	.368	.413	.458	.502	.547	.592	.636	.681	.725	.770	.815	.859	.904	.949	.993
30	.013	.058	.103	.147	.192	.237	.281	.326	.371	.415	.460	.504	.549	.594	.638	.683	.728	.772	.817	.862	.906	.951	.996
35	.016	.060	.105	.150	.194	.239	.283	.328	.373	.417	.462	.507	.551	.596	.641	.685	.730	.775	.819	.864	.908	.953	.998
40	.018	.062	.107	.152	.196	.241	.286	.330	.375	.420	.464	.509	.554	.598	.643	.687	.732	.777	.821	.866	.911	.955	.1000
45	.020	.065	.109	.154	.199	.243	.288	.333	.377	.422	.467	.511	.556	.600	.645	.690	.734	.779	.824	.868	.913	.958	
50	.022	.067	.112	.156	.201	.246	.290	.335	.379	.424	.469	.513	.558	.603	.647	.692	.737	.781	.826	.871	.915	.960	
55	.025	.069	.114	.158	.203	.248	.292	.337	.382	.426	.471	.516	.560	.605	.650	.694	.739	.783	.828	.873	.917	.962	
60	.027	.071	.116	.161	.205	.250	.295	.339	.384	.429	.473	.518	.562	.607	.652	.696	.741	.786	.830	.875	.920	.964	
65	.029	.074	.118	.163	.208	.252	.297	.342	.386	.431	.475	.520	.565	.609	.654	.699	.743	.788	.833	.877	.922	.967	
70	.031	.076	.121	.165	.210	.254	.299	.344	.388	.433	.478	.522	.567	.612	.656	.701	.746	.790	.835	.879	.924	.969	
75	.033	.078	.123	.167	.212	.257	.301	.346	.391	.435	.480	.525	.569	.614	.658	.703	.748	.792	.837	.882	.926	.971	
80	.036	.080	.125	.170	.214	.259	.304	.348	.393	.437	.482	.527	.571	.616	.661	.705	.750	.795	.839	.884	.929	.973	
85	.038	.083	.127	.172	.217	.261	.306	.350	.395	.440	.484	.529	.574	.618	.663	.708	.752	.797	.842	.886	.931	.975	
90	.040	.085	.129	.174	.219	.263	.308	.353	.397	.442	.487	.531	.576	.621	.665	.710	.754	.799	.844	.888	.933	.978	
95	.042	.087	.132	.176	.221	.266	.310	.355	.400	.444	.489	.533	.578	.623	.667	.712	.757	.801	.846	.891	.935	.980	

It will be observed that the above table gives the decimal part of ton of a varying number of pounds from 5 to 2240. This is for use where a quantity is expressed in tons and odd pounds. Example: 243 tons and 1150 lbs. would be expressed 243.513 tons. If entire quantity is expressed in pounds, reduce same to long tons by multiplying by .00044643, using system of multiplication described on page 23.

If quantity to be reduced to tons is more than 100000 lbs., multiply by .00446428.

Value Per Pound at Prices Per Bushel From 1/8 Cent to $10.00

Price Per Bushel Expressed in Cents	Turnips, Etc. 42	Dried Peaches, Etc. 33	Oats, Etc. 32	Top Onion Sets, Etc. 28	Blue Grass Etc. 14
1/8	.0000 29762	.0000 37879	.0000 39062	.0000 44643	.0000 89286
1/4	.0000 595	.0000 758	.0000 781	.0000 893	.0001 786
3/8	.0000 893	.0001 136	.0001 172	.0001 339	.0002 679
1/2	.0001 190	.0001 515	.0001 562	.0001 786	.0003 571
5/8	.0001 488	.0001 894	.0001 953	.0002 232	.0004 464
3/4	.0001 786	.0002 273	.0002 344	.0002 679	.0005 357
7/8	.0002 083	.0002 652	.0002 734	.0003 125	.0006 250
1	.0002 381	.0003 030	.0003 125	.0003 571	.0007 143
2	.0004 762	.0006 061	.0006 250	.0007 143	.0014 286
3	.0007 143	.0009 091	.0009 375	.0010 714	.0021 429
4	.0009 524	.0012 121	.0012 500	.0014 286	.0028 571
5	.0011 905	.0015 152	.0015 625	.0017 857	.0035 714
6	.0014 286	.0018 182	.0018 750	.0021 429	.0042 857
7	.0016 667	.0021 212	.0021 875	.0025 000	.0050 000
8	.0019 048	.0024 242	.0025 000	.0028 571	.0057 143
9	.0021 429	.0027 273	.0028 125	.0032 143	.0064 286
10	.0023 810	.0030 303	.0031 250	.0035 714	.0071 429
20	.0047 619	.0060 606	.0062 500	.0071 429	.0142 857
30	.0071 429	.0090 909	.0093 750	.0107 143	.0214 286
40	.0095 238	.0121 212	.0125 000	.0142 857	.0285 714
50	.0119 048	.0151 515	.0156 250	.0178 571	.0357 143
60	.0142 857	.0181 818	.0187 500	.0214 286	.0428 571
70	.0166 667	.0212 121	.0218 750	.0250 000	.0500 000
80	.0190 476	.0242 424	.0250 000	.0285 714	.0571 429
90	.0214 286	.0272 727	.0281 250	.0321 429	.0642 857
100	.0238 095	.0303 030	.0312 500	.0357 143	.0714 286
200	.0476 190	.0606 061	.0625 000	.0714 286	.1428 571
300	.0714 286	.0909 091	.0937 500	.1071 429	.2142 857
400	.0952 381	.1212 121	.1250 000	.1428 571	.2857 143
500	.1190 476	.1515 152	.1562 500	.1785 714	.3571 429
600	.1428 571	.1818 182	.1875 000	.2142 857	.4285 714
700	.1666 667	.2121 212	.2187 500	.2500 000	.5000 000
800	.1904 762	.2424 242	.2500 000	.2857 143	.5714 286
900	.2142 857	.2727 273	.2812 500	.3214 286	.6428 571
1000	.2380 952	.3030 303	.3125 000	.3571 429	.7142 857

NOTE: Legal weight of Commodities per bushel: Turnips, Sorghum Seed, 42 lbs.; Cotton Seed, Dried Peaches, 33 lbs.; Oats, 32 lbs.; Top Onion Sets, 28 lbs.; Blue Grass, Orchard Grass, Red Top, 14 lbs.

Decimal Equivalents—Pounds of a Bushel at 32 to 70 Pounds to Bushel

No. Lbs.	70	60	56	48	32
1	.014 29	.016 67	.017 86	.020 83	.031 25
2	.028 57	.033 33	.035 71	.041 67	.062 50
3	.042 86	.050 00	.053 57	.062 50	.093 75
4	.057 14	.066 67	.071 43	.083 33	.125 00
5	.071 43	.083 33	.089 29	.104 17	.156 25
6	.085 71	.100 00	.107 14	.125 00	.187 50
7	.100 00	.116 67	.125 00	.145 83	.218 75
8	.114 29	.133 33	.142 86	.166 67	.250 00
9	.128 57	.150 00	.160 71	.187 50	.281 25
10	.142 86	.166 67	.178 57	.208 33	.312 50
11	.157 14	.183 33	.196 43	.229 17	.343 75
12	.171 43	.200 00	.214 29	.250 00	.375 00
13	.185 71	.216 67	.232 14	.270 83	.406 25
14	.200 00	.233 33	.250 00	.291 67	.437 50
15	.214 29	.250 00	.267 86	.312 50	.468 75
16	.228 57	.266 67	.285 71	.333 33	.500 00
17	.242 86	.283 33	.303 57	.354 17	.531 25
18	.257 14	.300 00	.321 43	.375 00	.562 50
19	.271 43	.316 67	.339 29	.395 83	.593 75
20	.285 71	.333 33	.357 14	.416 67	.625 00
21	.300 00	.350 00	.375 00	.437 50	.656 25
22	.314 29	.366 67	.392 86	.458 33	.687 50
23	.328 57	.383 33	.410 71	.479 17	.718 75
24	.342 86	.400 00	.428 57	.500 00	.750 00
25	.357 14	.416 67	.446 43	.520 83	.781 25
26	.371 43	.433 33	.464 29	.541 67	.812 50
27	.385 71	.450 00	.482 14	.562 50	.843 75
28	.400 00	.466 67	.500 00	.583 33	.875 00
29	.414 29	.483 33	.517 86	.604 17	.906 25
30	.428 57	.500 00	.535 71	.625 00	.937 50
31	.442 86	.516 67	.553 57	.645 83	.968 75
32	.457 14	.533 33	.571 43	.666 67	1.000 00
33	.471 43	.550 00	.589 29	.687 50	
34	.485 71	.566 67	.607 14	.708 33	
35	.500 00	.583 33	.625 00	.729 17	
36	.514 29	.600 00	.642 86	.750 00	
37	.528 57	.616 67	.660 71	.770 83	
38	.542 86	.633 33	.678 57	.791 67	
39	.557 14	.650 00	.696 43	.812 50	
40	.571 43	.666 67	.714 29	.833 33	
50	.714 29	.833 33	.892 86		
60	.857 14	1.000 00			
70	1.000 00				

Decimal Equivalents—Parts of a Gross; also Square Inches to a Square Foot

No.	Dec.	No.	Dec.	No.	Dec.	No.	Dec.
1	.006 94	37	.256 94	73	.506 94	109	.756 94
2	.013 89	38	.263 89	74	.513 89	110	.763 89
3	.020 83	39	.270 83	75	.520 83	111	.770 83
4	.027 78	40	.277 78	76	.527 78	112	.777 78
5	.034 72	41	.284 72	77	.534 72	113	.784 72
6	.041 67	42	.291 67	78	.541 67	114	.791 67
7	.048 61	43	.298 61	79	.548 61	115	.798 61
8	.055 56	44	.305 56	80	.555 56	116	.805 56
9	.062 50	45	.312 50	81	.562 50	117	.812 50
10	.069 44	46	.319 44	82	.569 44	118	.819 44
11	.076 39	47	.326 39	83	.576 39	119	.826 39
12	.083 33	48	.333 33	84	.583 33	120	.833 33
13	.090 28	49	.340 28	85	.590 28	121	.840 28
14	.097 22	50	.347 22	86	.597 22	122	.847 22
15	.104 17	51	.354 17	87	.604 17	123	.854 17
16	.111 11	52	.361 11	88	.611 11	124	.861 11
17	.118 06	53	.368 06	89	.618 06	125	.868 06
18	.125 00	54	.375 00	90	.625 00	126	.875 00
19	.131 94	55	.381 94	91	.631 94	127	.881 94
20	.138 89	56	.388 89	92	.638 89	128	.888 89
21	.145 83	57	.395 83	93	.645 83	129	.895 83
22	.152 78	58	.402 78	94	.652 78	130	.902 78
23	.159 72	59	.409 72	95	.659 72	131	.909 72
24	.166 67	60	.416 67	96	.666 67	132	.916 67
25	.173 61	61	.423 61	97	.673 61	133	.923 61
26	.180 56	62	.430 56	98	.680 56	134	.930 56
27	.187 50	63	.437 50	99	.687 50	135	.937 50
28	.194 44	64	.444 44	100	.694 44	136	.944 44
29	.201 39	65	.451 39	101	.701 39	137	.951 39
30	.208 83	66	.458 33	102	.708 33	138	.958 33
31	.215 28	67	.465 28	103	.715 28	139	.965 28
32	.222 22	68	.472 22	104	.722 22	140	.972 22
33	.229 17	69	.479 17	105	.729 17	141	.979 17
34	.236 11	70	.486 11	106	.736 11	142	.986 11
35	.243 06	71	.493 06	107	.743 06	143	.993 06
36	.250 00	72	.500 00	108	.750 00	144	1.000 00

EXAMPLE No. 1: What is the value of 4 gross and 17 bolts @ $1.45 per gross? Solution: 4.118 × $1.45 = $5.97, answer.

EXAMPLE No. 2: What is the value of 23 square feet, 113 square inches, @ 35c per square foot? Solution: 23.784 × 35 = $8.32, answer.

Selling Price to Yield Any Desired Percentage of Profit on Gross Selling Price

%		%		%		%	
1	1.01 01	26	1.35 14	51	2.04 08	76	4.16 67
2	1.02 04	27	1.36 99	52	2.08 33	77	4.34 78
3	1.03 09	28	1.38 89	53	2.12 77	78	4.54 54
4	1.04 17	29	1.40 85	54	2.17 39	79	4.76 19
5	1.05 26	30	1.42 86	55	2.22 22	80	5.00 00
6	1.06 38	31	1.44 93	56	2.27 27	81	5.26 32
7	1.07 53	32	1.47 06	57	2.32 56	82	5.55 56
8	1.08 70	33	1.49 25	58	2.38 10	83	5.88 24
9	1.09 89	34	1.51 52	59	2.43 90	84	6.25 00
10	1.11 11	35	1.53 85	60	2.50 00	85	6.66 67
11	1.12 36	36	1.56 25	61	2.56 41	86	7.14 29
12	1.13 64	37	1.58 73	62	2.63 16	87	7.69 23
13	1.14 94	38	1.61 29	63	2.70 27	88	8.33 33
14	1.16 28	39	1.63 93	64	2.77 78	89	9.09 09
15	1.17 65	40	1.66 67	65	2.85 71	90	10.00 00
16	1.19 05	41	1.69 49	66	2.94 12	91	11.11 11
17	1.20 48	42	1.72 41	67	3.03 03	92	12.50 00
18	1.21 95	43	1.75 44	68	3.12 50	93	14.28 57
19	1.23 46	44	1.78 57	69	3.22 58	94	16.66 67
20	1.25 00	45	1.81 82	70	3.33 33	95	20.00 00
21	1.26 58	46	1.85 19	71	3.44 83	96	25.00 00
22	1.28 21	47	1.88 68	72	3.57 14	97	33.33 33
23	1.29 87	48	1.92 31	73	3.70 37	98	50.00 00
24	1.31 58	49	1.96 08	74	3.84 62	99	100.00 00
25	1.33 33	50	2.00 00	75	4.00 00		

RULE: To the rate of net profit desired, add the percentage representing ratio of selling cost to gross sales. Find this amount in the columns of the table headed "%", and multiply the value corresponding thereto by the cost price of the goods. Point off the proper number of decimals and the product will be the correct selling price.

EXAMPLE: A merchant's cost of doing business is 13 per cent of his gross sales. At what price must he sell a suit of clothing costing $13.25 to realize a net profit of 25 per cent of the gross selling price?

Solution: Add 13 per cent and 25 per cent, which makes 38 per cent. The amount in the table corresponding thereto is 1.61 29. This multiplied by 13.25 makes $21.370925.

Should it be desired simply to provide a certain gross profit without reference to the selling cost, take the value from the table corresponding to the gross profit desired and multiply the same by the cost price.

Decimal Equivalents

Ounces to a Pound		Drams to a Pound		Parts of a Dozen, Foot and Pound, Troy	
No. Ounces	Dec. of Pound	No. Drams	Dec. of Pound	No.	Decimal
1	.0625	1	.0039	1	.08333
2	.1250	2	.0078	2	.16667
3	.1875	3	.0117	3	.25000
4	.2500	4	.0156	4	.33333
5	.3125	5	.0195	5	.41667
6	.3750	6	.0234	6	.50000
7	.4375	7	.0273	7	.58333
8	.5000	8	.0312	8	.66667
9	.5625	9	.0352	9	.75000
10	.6250	10	.0391	10	.83333
11	.6875	11	.0430	11	.91667
12	.7500	12	.0469		
13	.8125	13	.0508		
14	.8750	14	.0547		
15	.9375	15	.0586		

Examples Illustrating Use of the Tables

EXAMPLE: Pounds, Ounces and Drams: Find the value of 43 pounds, 7 ounces and 6 drams at $1.25 per pound. Solution: 43 + .4375 + .0234 = 43.4609 × 1.25 = $54.32.

EXAMPLE: Dozens and parts of a dozen: Find the value of 2 dozen and 7 files at $2.35 per dozen. Solution: 2 + .583 = 2.583 × 2.35 = $6.07.

EXAMPLE: Feet and Inches: Find the value of 19 feet and 5 inches of picture molding at 84 cents per foot. Solution: 19 + .41667 = 19.41667 × .84 = $16.31.

These tables of Decimal Equivalents will be found most helpful in dealing with compound numbers. Simply substitute the decimal equivalents as shown by the tables and the Dalton will then handle them as easily as whole numbers. The answer will, of course, be decimally expressed. If necessary, however, the decimal may be quickly reconverted into its original equivalent. For instance, suppose we have been dealing with square feet and square inches and have as our answer 123.674 square feet: Reduce the decimal .674 to square inches by multiplying by 144 (the number of square inches in a square foot), the equivalent being 97 square inches and a small fraction.

TABLE OF NET VALUES OF CHAIN DISCOUNTS

RATE %		2½	5	7½	10	12½	15	16⅔	17½	20	22½	25	27½
2½	.975	.95062	.92625	.90187	.8775	.85312	.82875	.8125	.80437	.78	.75562	.73125	.70687
5	.95	.92625	.9025	.87875	.855	.83125	.8075	.79167	.78375	.76	.73625	.7125	.68875
5–2½	.92625	.90309	.87994	.85678	.83362	.81047	.78731	.77187	.76416	.741	.71784	.69469	.67153
5–5	.9025	.87994	.85737	.83481	.81225	.78969	.76712	.75208	.74456	.722	.69944	.67687	.65431
5–5–2½	.87994	.85794	.83594	.81394	.79194	.76995	.74795	.73328	.72595	.70395	.68195	.65995	.63795
7½	.925	.90187	.87875	.85562	.8325	.80937	.78625	.77083	.76312	.74	.71687	.69375	.67062
7½–2½	.90187	.87933	.85678	.83423	.81169	.78914	.76659	.75156	.74405	.7215	.69895	.67641	.65386
7½–5	.87875	.85678	.83481	.81284	.79087	.76891	.74694	.73229	.72497	.703	.68103	.65906	.63709
10	.9	.8775	.855	.8325	.81	.7875	.765	.75	.7425	.72	.6975	.675	.6525
10–2½	.8775	.85556	.83362	.81169	.78975	.76781	.74587	.73125	.72394	.702	.68006	.65812	.63619
10–5	.855	.83362	.81225	.79087	.7695	.74812	.72675	.7125	.70537	.684	.66262	.64125	.61987
10–5–2½	.83362	.81278	.79194	.7711	.75026	.72942	.70858	.69469	.68774	.6669	.64606	.62522	.60438
10–7½	.8325	.81169	.79087	.77006	.74925	.72844	.70762	.69375	.68681	.666	.64519	.62437	.60356
10–10	.81	.78975	.7695	.74925	.729	.70875	.6885	.675	.66825	.648	.62775	.6075	.58725
10–10–5	.7695	.75026	.73102	.71179	.69255	.67331	.65407	.64125	.63484	.6156	.59636	.57712	.55789
10–10–5–2½	.75026	.73151	.71275	.69399	.67524	.65648	.63772	.62522	.61897	.60021	.58145	.5627	.54394
10–10–10	.729	.71077	.69255	.67432	.6561	.63787	.61965	.6075	.60142	.5832	.56497	.54675	.52852

RATE %	30	32½	33⅓	35	37½	40	42½	45	47½	50	52½	55	57½
2½	.6825	.65812	.65	.63375	.60937	.585	.56062	.53625	.51187	.4875	.46312	.43875	.41437
5	.665	.64125	.63333	.6175	.59375	.57	.54625	.5225	.49875	.475	.45175	.4275	.40375
5–2½	.64837	.62522	.6175	.60206	.57891	.55575	.53259	.50944	.48628	.46312	.43997	.41681	.39366
5–5	.63175	.60919	.60167	.58662	.56406	.5415	.51894	.49637	.47381	.45125	.42869	.40612	.38356
5–5–2½	.61596	.59396	.58663	.57196	.54996	.52796	.50596	.48397	.46197	.43997	.41797	.39597	.37397
7½	.6475	.62437	.61667	.60125	.57812	.555	.53187	.50875	.48562	.4625	.43937	.41625	.39312
7½–2½	.63131	.60877	.60125	.58622	.56367	.54112	.51858	.49603	.47348	.45094	.42839	.40584	.3833
7½–5	.61512	.59316	.58583	.57119	.54922	.52275	.50528	.48331	.46134	.43937	.41741	.39544	.37347
10	.63	.6075	.6	.585	.5625	.54	.5175	.495	.4725	.45	.4275	.405	.3825
10–2½	.61425	.59231	.585	.57037	.54844	.5265	.50456	.48262	.46069	.43875	.41681	.39487	.37294
10–5	.5985	.57712	.57	.55575	.53437	.513	.49162	.47025	.44887	.4275	.40612	.38475	.36337
10–5–2½	.58354	.5627	.55575	.54186	.52102	.50017	.47933	.45849	.43765	.41681	.39597	.37513	.35429
10–7½	.58275	.56194	.555	.54112	.52031	.4995	.47869	.45787	.43706	.41625	.39544	.37462	.35381
10–10	.567	.54675	.54	.5265	.50625	.486	.46575	.4455	.42525	.405	.38475	.3645	.34425
10–10–5	.53865	.51941	.513	.50017	.48094	.4617	.44246	.42322	.43099	.38475	.36551	.34627	.32704
10–10–5–2½	.52518	.50643	.50017	.48767	.46891	.45016	.4314	.41264	.39389	.37513	.35637	.33762	.31886
10–10–10	.5103	.49207	.486	.47385	.45562	.4374	.41917	.40095	.38272	.3645	.34627	.32805	.30982

RATE %	60	62½	65	66⅔	67½	70	72½	75	77½	80	82½	83⅓	85
2½	.39	.36562	.34125	.325	.31687	.2925	.26812	.24375	.21937	.195	.17062	.1625	.14625
5	.38	.35625	.3325	.31667	.30875	.285	.26125	.2375	.21375	.19	.16625	.15833	.1425
5–2½	.3705	.34734	.32419	.30875	.30103	.27787	.25472	.23156	.20841	.18525	.16209	.15437	.13894
5–5	.361	.33844	.31587	.30083	.29331	.27075	.24819	.22562	.20306	.1805	.15794	.15042	.13537
5–5–2½	.35197	.32998	.30798	.29331	.28598	.26398	.24198	.21998	.19799	.17599	.15399	.14666	.13199
7½	.37	.34687	.32375	.30883	.30062	.2775	.25437	.23125	.20812	.185	.16187	.15417	.13875
7½–2½	.36075	.3382	.31566	.30062	.29311	.27056	.24802	.22547	.20292	.18037	.15783	.15031	.13528
7½–5	.3515	.32953	.30756	.29292	.28559	.26362	.24166	.21969	.19772	.17575	.15378	.14646	.13181
10	.36	.3375	.315	.3	.2925	.27	.2475	.225	.2025	.18	.1575	.15	.135
10–2½	.351	.32906	.30712	.2925	.28519	.26325	.24131	.21937	.19744	.1755	.16356	.14625	.13162
10–5	.342	.32062	.29925	.285	.27787	.2565	.23512	.21375	.19237	.171	.14962	.1425	.12825
10–5–2½	.33345	.31261	.29177	.27787	.27093	.25009	.22925	.20841	.18757	.16672	.14588	.13894	.12504
10–7½	.333	.31219	.29137	.2775	.27056	.24975	.22894	.20812	.18731	.1665	.14569	.13875	.12487
10–10	.324	.30375	.2835	.27	.26325	.243	.22275	.2025	.18225	.162	.14175	.135	.1215
10–10–5	.3078	.28856	.26932	.2565	.25009	.23085	.21161	.19237	.17314	.1539	.13466	.12825	.11542
10–10–5–2½	.3001	.28135	.26259	.25009	.24384	.22508	.20632	.18757	.16881	.15005	.1313	.12504	.11254
10–10–10	.2916	.27337	.25515	.243	.23692	.2187	.20047	.18225	.16402	.1458	.12757	.125	.10935

RATE %	87½	90	92½	95	97½
2½	.12187	.0975	.07312	.04875	.02437
5	.11875	.095	.07125	.0475	.02375
5–2½	.11578	.09262	.06947	.04631	.02316
5–5	.11281	.09025	.06769	.04512	.02256
5–5–2½	.10999	.08799	.066	.044	.022
7½	.11562	.0925	.06937	.04625	.02312
7½–2½	.11273	.09019	.06764	.04509	.02255
7½–5	.10984	.08787	.06591	.04394	.02197
10	.1125	.09	.0675	.045	.0225
10–2½	.10969	.08775	.06581	.04387	.02194
10–5	.10687	.0855	.06412	.04275	.02137
10–5–2½	.1042	.08336	.06252	.04168	.02084
10–7½	.10404	.08325	.06244	.04162	.02081
10–10	.10125	.081	.06075	.0405	.02025
10–10–5	.09619	.07695	.05771	.03847	.01924
10–10–5–2½	.09378	.07503	.05627	.03751	.01876
10–10–10	.09112	.0729	.05467	.03645	.01822

The foregoing table shows the net values of the discounts appearing at the left *and* the discount shown at the top of each column. Find the line at the left which contains ALL BUT ONE of the discounts and take the value shown on that line in the column headed by the remaining discount. A simple multiplication of the amount by net value of a chain of discounts as shown by the table will then give the "net." (See "Multiplication from Left to Right," on page 23).

The relative order in which the discounts may be stated makes no difference. The net value, for instance, of 10-10 and 2½ is exactly the same as that of 10-2½ and 10.

TABLE OF RECIPROCALS—1 TO 400

See "Division by Reciprocals," Page 26

No.	Recipl.	No.	Recipl.	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00
1	1.000000000	51	.019607843	101	9900990	151	6622517	201	4975124	251	3984064	301	3322259	351	2849003
2	0.500000000	52	.019230769	102	9803922	152	6578947	202	4950495	252	3968254	302	3311258	352	2840909
3	.333333333	53	.018867925	103	9708738	153	6535948	203	4926108	253	3952569	303	3300330	353	2832861
4	.250000000	54	.018518519	104	9615385	154	6493506	204	4901961	254	3937008	304	3289474	354	2824859
5	.200000000	55	.018181818	105	9523810	155	6451613	205	4878049	255	3921569	305	3278689	355	2816901
6	.166666667	56	.017857143	106	9433962	156	6410256	206	4854369	256	3906250	306	3267974	356	2808989
7	.142857143	57	.017543860	107	9345794	157	6369427	207	4830918	257	3891051	307	3257329	357	2801120
8	.125000000	58	.017241379	108	9259259	158	6329114	208	4807692	258	3875969	308	3246753	358	2793296
9	.111111111	59	.016949153	109	9174312	159	6289308	209	4784689	259	3861004	309	3236246	359	2785515
10	.100000000	60	.016666667	110	9090909	160	6250000	210	4761905	260	3846154	310	3225806	360	2777778
11	.090909091	61	.016393443	111	9009009	161	6211180	211	4739336	261	3831418	311	3215434	361	2770083
12	.083333333	62	.016129032	112	8928571	162	6172840	212	4716981	262	3816794	312	3205128	362	2762431
13	.076923077	63	.015873016	113	8849558	163	6134969	213	4694836	263	3802281	313	3194888	363	2754821
14	.071428571	64	.015625000	114	8771930	164	6097561	214	4672897	264	3787879	314	3184713	364	2747253
15	.066666667	65	.015384615	115	8695652	165	6060606	215	4651163	265	3773585	315	3174603	365	2739726
16	.062500000	66	.015151515	116	8620690	166	6024096	216	4629630	266	3759398	316	3164557	366	2732240
17	.058823529	67	.014925373	117	8547009	167	5988024	217	4608295	267	3745318	317	3154574	367	2724796
18	.055555556	68	.014705882	118	8474576	168	5952381	218	4587156	268	3731343	318	3144654	368	2717391
19	.052631579	69	.014492754	119	8403361	169	5917160	219	4566210	269	3717472	319	3134796	369	2710027
20	.050000000	70	.014285714	120	8333333	170	5882353	220	4545455	270	3703704	320	3125000	370	2702703
21	.047619048	71	.014084507	121	8264463	171	5847953	221	4524887	271	3690037	321	3115265	371	2695418
22	.045454545	72	.013888889	122	8196721	172	5813953	222	4504505	272	3676471	322	3105590	372	2688172
23	.043478261	73	.013698630	123	8130081	173	5780347	223	4484305	273	3663004	323	3095975	373	2680965
24	.041666667	74	.013513514	124	8064516	174	5747126	224	4464286	274	3649635	324	3086420	374	2673797
25	.040000000	75	.013333333	125	8000000	175	5714286	225	4444444	275	3636364	325	3076923	375	2666667
26	.038461538	76	.013157895	126	7936508	176	5681818	226	4424779	276	3623188	326	3067485	376	2659574
27	.037037037	77	.012987013	127	7874016	177	5649718	227	4405286	277	3610108	327	3058104	377	2652520
28	.035714286	78	.012820513	128	7812500	178	5617978	228	4385965	278	3597122	328	3048780	378	2645506
29	.034482759	79	.012658228	129	7751938	179	5586592	229	4366812	279	3584229	329	3039514	379	2638523
30	.033333333	80	.012500000	130	7692308	180	5555556	230	4347826	280	3571429	330	3030303	380	2631572
31	.032258065	81	.012345679	131	7633588	181	5524862	231	4329004	281	3558719	331	3021148	381	2624672
32	.031250000	82	.012195122	132	7575758	182	5494505	232	4310345	282	3546099	332	3012048	382	2617801
33	.030303030	83	.012048193	133	7518797	183	5464481	233	4291845	283	3533569	333	3003003	383	2610966
34	.029411765	84	.011904762	134	7462687	184	5434783	234	4273504	284	3521127	334	2994012	384	2604167
35	.028571429	85	.011764706	135	7407407	185	5405405	235	4255319	285	3508772	335	2985075	385	2597403
36	.027777778	86	.011627907	136	7352941	186	5376344	236	4237288	286	3496503	336	2976190	386	2590674
37	.027027027	87	.011494253	137	7299270	187	5347594	237	4219409	287	3484321	337	2967359	387	2583979
38	.026315789	88	.011363636	138	7246377	188	5319149	238	4201681	288	3472222	338	2958580	388	2577320
39	.025641026	89	.011235955	139	7194245	189	5291005	239	4184100	289	3460208	339	2949853	389	2570694
40	.025000000	90	.011111111	140	7142857	190	5263158	240	4166667	290	3448276	340	2941176	390	2564103
41	.024390244	91	.010989011	141	7092199	191	5235602	241	4149378	291	3436426	341	2932551	391	2557545
42	.023809524	92	.010869565	142	7042254	192	5208333	242	4132231	292	3424658	342	2923977	392	2551020
43	.023255814	93	.010752688	143	6993007	193	5181347	243	4115226	293	3412969	343	2915452	393	2544529
44	.022727273	94	.010638298	144	6944444	194	5154639	244	4098361	294	3401361	344	2906977	394	2538071
45	.022222222	95	.010526316	145	6896552	195	5128205	245	4081633	295	3389831	345	2898551	395	2531646
46	.021739130	96	.010416667	146	6849315	196	5102041	246	4065041	296	3378378	346	2890173	396	2525253
47	.021276596	97	.010309278	147	6802721	197	5076142	247	4048583	297	3367003	347	2881844	397	2518892
48	.020833333	98	.010204082	148	6756757	198	5050505	248	4032258	298	3355705	348	2873563	398	2512563
49	.020408163	99	.010101010	149	6711409	199	5025126	249	4016064	299	3344482	349	2865330	399	2506266
50	.020000000	100	.010000000	150	6666667	200	5000000	250	4000000	300	3333333	350	2857143	400	2500000

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No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00	No.	Recipl. .00
401	2493766	**451**	2217295	**501**	1996008	**551**	1814882	**601**	1663894	**651**	1536098	**701**	1426534	**751**	1331558
402	2487562	**452**	2212389	**502**	1992032	**552**	1811594	**602**	1661130	**652**	1533742	**702**	1424501	**752**	1329787
403	2481390	**453**	2207506	**503**	1988072	**553**	1808318	**603**	1658375	**653**	1531394	**703**	1422475	**753**	1328021
404	2475248	**454**	2202643	**504**	1984127	**554**	1805054	**604**	1655629	**654**	1529052	**704**	1420455	**754**	1326260
405	2469136	**455**	2197802	**505**	1980198	**555**	1801802	**605**	1652893	**655**	1526718	**705**	1418440	**755**	1324503
406	2463054	**456**	2192982	**506**	1976285	**556**	1798561	**606**	1650165	**656**	1524390	**706**	1416431	**756**	1322751
407	2457002	**457**	2188184	**507**	1972387	**557**	1795332	**607**	1647446	**657**	1522070	**707**	1414427	**757**	1321004
408	2450980	**458**	2183406	**508**	1968504	**558**	1792115	**608**	1644737	**658**	1519757	**708**	1412429	**758**	1319261
409	2444988	**459**	2178649	**509**	1964637	**559**	1788909	**609**	1642036	**659**	1517451	**709**	1410437	**759**	1317523
410	2439024	**460**	2173913	**510**	1960784	**560**	1785714	**610**	1639344	**660**	1515152	**710**	1408451	**760**	1315789
411	2433090	**461**	2169197	**511**	1956947	**561**	1782531	**611**	1636661	**661**	1512859	**711**	1406470	**761**	1314060
412	2427184	**462**	2164502	**512**	1953125	**562**	1779359	**612**	1633987	**662**	1510574	**712**	1404494	**762**	1312336
413	2421308	**463**	2159827	**513**	1949318	**563**	1776199	**613**	1631321	**663**	1508296	**713**	1402525	**763**	1310616
414	2415459	**464**	2155172	**514**	1945525	**564**	1773050	**614**	1628664	**664**	1506024	**714**	1400560	**764**	1308901
415	2409639	**465**	2150538	**515**	1941748	**565**	1769912	**615**	1626016	**665**	1503759	**715**	1398601	**765**	1307190
416	2403846	**466**	2145923	**516**	1937984	**566**	1766784	**616**	1623377	**666**	1501502	**716**	1396648	**766**	1305483
417	2398082	**467**	2141328	**517**	1934236	**567**	1763668	**617**	1620746	**667**	1499250	**717**	1394700	**767**	1303781
418	2392344	**468**	2136752	**518**	1930502	**568**	1760563	**618**	1618123	**668**	1497006	**718**	1392758	**768**	1302083
419	2386635	**469**	2132196	**519**	1926782	**569**	1757469	**619**	1615509	**669**	1494768	**719**	1390821	**769**	1300390
420	2380952	**470**	2127660	**520**	1923077	**570**	1754386	**620**	1612903	**670**	1492537	**720**	1388889	**770**	1298701
421	2375297	**471**	2123142	**521**	1919386	**571**	1751313	**621**	1610306	**671**	1490313	**721**	1386963	**771**	1297017
422	2369668	**472**	2118644	**522**	1915709	**572**	1748252	**622**	1607717	**672**	1488095	**722**	1385042	**772**	1295337
423	2364066	**473**	2114165	**523**	1912046	**573**	1745201	**623**	1605136	**673**	1485884	**723**	1383126	**773**	1293661
424	2358491	**474**	2109705	**524**	1908397	**574**	1742160	**624**	1602564	**674**	1483680	**724**	1381215	**774**	1291990
425	2352941	**475**	2105263	**525**	1904762	**575**	1739130	**625**	1600000	**675**	1481481	**725**	1379310	**775**	1290323
426	2347418	**476**	2100840	**526**	1901141	**576**	1736111	**626**	1597444	**676**	1479290	**726**	1377410	**776**	1288660
427	2341920	**477**	2096436	**527**	1897533	**577**	1733102	**627**	1594896	**677**	1477105	**727**	1375516	**777**	1287001
428	2336449	**478**	2092050	**528**	1893939	**578**	1730104	**628**	1592357	**678**	1474926	**728**	1373626	**778**	1285347
429	2331002	**479**	2087683	**529**	1890359	**579**	1727116	**629**	1589825	**679**	1472754	**729**	1371742	**779**	1283697
430	2325581	**480**	2083333	**530**	1886792	**580**	1724138	**630**	1587302	**680**	1470588	**730**	1369863	**780**	1282051
431	2320186	**481**	2079002	**531**	1883239	**581**	1721170	**631**	1584786	**681**	1468429	**731**	1367989	**781**	1280410
432	2314815	**482**	2074689	**532**	1879699	**582**	1718213	**632**	1582278	**682**	1466276	**732**	1366120	**782**	1278772
433	2309469	**483**	2070393	**533**	1876173	**583**	1715266	**633**	1579779	**683**	1464129	**733**	1364256	**783**	1277139
434	2304147	**484**	2066116	**534**	1872659	**584**	1712329	**634**	1577287	**684**	1461988	**734**	1362398	**784**	1275510
435	2298851	**485**	2061856	**535**	1869159	**585**	1709402	**635**	1574803	**685**	1459854	**735**	1360544	**785**	1273885
436	2293578	**486**	2057613	**536**	1865672	**586**	1706485	**636**	1572327	**686**	1457726	**736**	1358696	**786**	1272265
437	2288330	**487**	2053388	**537**	1862197	**587**	1703578	**637**	1569859	**687**	1455604	**737**	1356852	**787**	1270648
438	2283105	**488**	2049180	**538**	1858736	**588**	1700680	**638**	1567398	**688**	1453488	**738**	1355014	**788**	1269036
439	2277904	**489**	2044990	**539**	1855288	**589**	1697793	**639**	1564945	**689**	1451379	**739**	1353180	**789**	1267427
440	2272727	**490**	2040816	**540**	1851852	**590**	1694915	**640**	1562500	**690**	1449275	**740**	1351351	**790**	1265823
441	2267574	**491**	2036660	**541**	1848429	**591**	1692047	**641**	1560062	**691**	1447178	**741**	1349528	**791**	1264223
442	2262443	**492**	2032520	**542**	1845018	**592**	1689189	**642**	1557632	**692**	1445087	**742**	1347709	**792**	1262626
443	2257336	**493**	2028398	**543**	1841621	**593**	1686341	**643**	1555210	**693**	1443001	**743**	1345895	**793**	1261034
444	2252252	**494**	2024291	**544**	1838235	**594**	1683502	**644**	1552795	**694**	1440922	**744**	1344086	**794**	1259446
445	2247191	**495**	2020202	**545**	1834862	**595**	1680672	**645**	1550388	**695**	1438849	**745**	1342282	**795**	1257862
446	2242152	**496**	2016129	**546**	1831502	**596**	1677852	**646**	1547988	**696**	1436782	**746**	1340483	**796**	1256281
447	2237136	**497**	2012072	**547**	1828154	**597**	1675042	**647**	1545595	**697**	1434720	**747**	1338688	**797**	1254705
448	2232143	**498**	2008032	**548**	1824818	**598**	1672241	**648**	1543210	**698**	1432665	**748**	1336898	**798**	1253133
449	2227171	**499**	2004008	**549**	1821494	**599**	1669449	**649**	1540832	**699**	1430615	**749**	1335113	**799**	1251564
450	2222222	**500**	2000000	**550**	1818182	**600**	1666667	**650**	1538462	**700**	1428571	**750**	1333333	**800**	1250000

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